



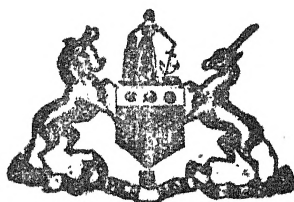
AGRICULTURAL RESEARCH INSTITUTE
PUSA

THE Agricultural Journal OF THE CAPE OF GOOD HOPE.

JULY, 1906

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THE Agricultural Journal

OF THE CAPE OF GOOD HOPE.

No. 1.

JULY 1st, 1906.

VOL. XXIX.

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NOTES.

Cracked Pipes under Dams.

We desire to call attention to the memo. on another page on the above subject as of special interest to farmers. The weakness noted will account for much otherwise unaccountable trouble which arises on many farms where dam walls are pierced for service pipes. The Director of Irrigation very kindly submitted the memo. for publication.

Departmental Publications.

Attention is directed to a new departure which has just been authorised by the Minister for Agriculture. In future *bona fide* members of Farmers' or Fruit Growers' Associations can obtain copies of the Departmental Publications (listed in every issue of the *Agricultural Journal*) free of charge on application through the Secretary of the Association they belong to. Applications should be addressed to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town.

Actinomyces in Sheep.

Mr. Bowhill of the Veterinary Laboratory, Grahamstown, in a communication dated the 31st May last, states that, a short time previously, he received a piece of the lung of a bastard sheep for examination. Description:—"The major portion of the lung was consolidated, almost scirrhus, in fact a typical infective granulomata. I found a species of *Actinomyces* in the pus present in the scirrhus portion, as well as in sections. I consider this a disease in sheep heretofore undescribed in this country." *Actinomyces*—The Ray Fungus—although comparatively common in cattle, is very rare in sheep. This is the first case that we have heard of in this Colony. The owner, however, reports that he has lost 7 or 8 bastard sheep, and the lungs of the lot presented a similar appearance.—D.H.

Death of Mr. W. Farrer, of N. S. Wales.

We learn with much regret of the death of Mr. W. Farrer of Lanbrigg, New South Wales, whose life has been one of the greatest service to agriculturists all the world over, if more particularly also to his own country. His name will go down to posterity for his epoch-making work in the improvement of wheat, particularly by the processes of cross fertilisation, which he brought to such perfection that he could at will in the course of a few

seasons create a wheat with any desired qualities or combination of qualities. In this way he opened up a field of research full of limitless possibilities and widened the area of the cultivation of crops as well as increasing the yields. Of him it may be said in a higher degree than of most that he made two blades grow where there was but one before.—E.A.N.

An Important Arrival.

An importation of considerable interest to dairy farmers is that of a high class Lincoln red bull brought out by Mr. Ferdinand Versfeld, of Rheboksfontein, Darling, for use with his pure and cross-bred Ayrshire cows. The bull in question, "Burton Carl," is a particularly stylish and well-developed specimen of his breed, and a very typical dairy bull, every feature pointing to that most necessary combination of milk-giving capacity, with a sound constitution. His sire, Burton Rex, weighed 2,380 lbs., and his dam gave 1,087 gallons, or 6,522 bottles of milk in one lactation period, while the average of the herd she belonged to is worth giving as demonstrating most clearly the remarkable milking powers of the Lincoln reds. It is given as follows:—

1,900 average of 36 cows; 785 gallons; or 4,710 bottles.					
1,901	"	48	"	758	" " 4,548 "
1,902	"	40	"	776	" " 4,656 "
1,903	"	42	"	780	" " 4,680 "
1,904	"	43	"	842	" " 5,052 "

The bull, which arrived in first-rate condition, was purchased from Mr. John Evans, of Burton, near Lincoln. The peculiar significance of the purchase of this bull is that he is intended entirely for cross-breeding; there are no Lincoln reds or shorthorns in his vicinity. By this means Mr. Versfeld hopes to improve his milking herd in size and milking qualities, particularly also in the size of the teats. A similar experiment is in progress in the Eastern Province at Queenstown, where Mr. Arnold, Blackwoods, is using a bull of the same stamp on certain of his Ayrshire cows. When it is remembered that it is the Shorthorn-Ayrshire cross, which is the standard dairy cow of Australia, the importance of these experiments will be appreciated. The suitability of the cross it will take some years to establish, but meantime the progress of the efforts of these two enterprising gentlemen will be watched with keen interest by many in the Colony.—E. A. N.

Irrigation at Robertson—A New Device.

A good deal has been done during the last few years in irrigating large tracts of land by means of gravitation canals, power pumps, windmills, etc., and, although they have proved generally successful, there is no doubt that some of the schemes, particularly canals, have certain drawbacks. They are very costly to build and

maintain, and often have to be carried through country of which a great percentage is too poor in quality to pay for the cost of irrigating. They are subject to heavy damage by floods, and considerable difficulty is often experienced in obtaining the co-operation of the farmers, which is essential to the carrying out of these projects. An entirely new scheme has been erected at Riverside farm in the Robertson district by the civil engineer Mr. Boldt who has succeeded in irrigating some 300 morgen of land at a level of 80 feet above the river bed. The following details have been supplied to us. A dam sufficiently high is built across the river to supply the motive power to drive a waterwheel, powerful enough to drive two pumps with a lifting capacity of 1 million gallons per 24 hours to a level of 80 feet or more if required. A solid masonry wall which rises above the high water level, is built at one end of the dam. Parallel with this wall is a larger masonry platform on which two powerful pumps are mounted, a waterwheel is hung between these two walls, which also form a race for the water that supplies the power to turn the wheel. The water is forced through 9-inch pipeline up to the level required, discharged into a furrow and then led to any part of the farm. One of the novel features of these works is that the waterwheel rises and falls with the flow of the river, thus preventing any submersion of the wheel and insuring an even supply. Provision is also made in time of scarcity, whereby the water can be conserved until the dam is filled, when the machinery can again be set in motion. It is quite surprising how easily the many technical difficulties have been overcome, resulting in the smooth working of the plant without the aid of complicated machinery liable to expensive repairs. The whole works give one the impression of great simplicity, solidity and durability. Mr. Boldt has proved by these works that valuable land can be irrigated without long and expensive canals or steam engines and that with a moderate cost that is within the reach of all. He is to be congratulated in attaining this result, which is of such vital importance to the country, the more so that he had such faith in his invention that he built the works and risked considerable capital on the principle of no success no pay. Mr. Boldt would be glad to show anyone interested over the works by appointment, and we draw attention to the advertisement which appears in another part of this issue.

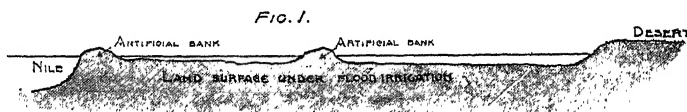
Karoo Kraal Manure.

At the meeting of the Paarl Farmers' Association, held on the 29th of May, complaints were made by some of the members, that during the last few weeks the railway department had raised the estimated weight at which kraal manure is to be conveyed and that the railway rates now being charged, would make it quite impossible for the farmers in the Western Province to use it. Kraal manure

in a 16 foot truck has always been estimated at from 5 to 6 tons, and it is only during the present season that the farmers here have been enabled to go in for same, by getting the purchase price reduced. Now however that the question of price is settled the railway department are raising the estimated weight from 6 to 10 tons so that the combined purchase price and railway rates, bring the amount paid for kraal manure beyond its value, as proved by analysis. If this is insisted on it will mean that the farmers in the Western Province will be compelled to give up the use of kraal manure. This would be a great pity, for there are millions of tons of this manure lying in the Karoo, and it is found by experiments made that kraal manure, ash owing to its richness in phosphates and potash is the manure required in conjunction with government guano the latter having a high percentage of nitrogen. The matter was left in the hands of the Parliamentary Committee.

Sketches in Irrigation practice.

Mr. C. E. Lawford, Civil Engineer, writes :—The first attempt at artificial irrigation on a large scale, (which took place doubtless in pre-historic times). was probably made by cutting channels through the banks of such rivers as the Nile, the Euphrates, and

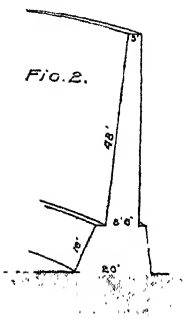


the Indus, all of which are higher than the country on either side of them. In Egypt this was the only means of diverting water, which had been practised, for seven thousand years up to the time of the French occupation early in the nineteenth century.

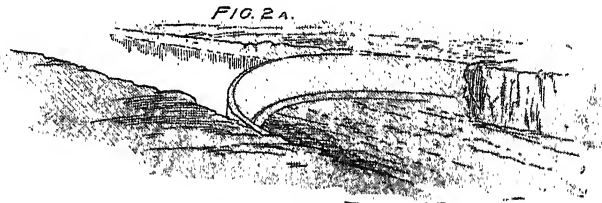
Weirs and Dams.—The second step in irrigation was perhaps, either forming bush and sand diversion weirs, (such as are still used in this country), or piling up massive structures of loose stones. Either of these would raise the water level in flood time and so reduce the depth necessary for the leading furrow. A more permanent, form of weir followed; such as the Grand Anicut in Madras which is said to have stood successfully for sixteen hundred years in spite of being built only of rough stones set in clay. Its length is 1,080 feet, its height above river bed 15 to 18 feet, and its greatest thickness 60 feet.

Of more recent construction are the Spanish Dams, some of which have stood for 400 years. Their chief characteristic is the enormous amount of masonry used in their construction. The

Alicante Dam is an instance; its height is 134 feet, its base thickness 110 feet, its top thickness 65 feet. It is slightly curved with the convex side up stream. The rock gorge which it closes is 30 feet broad at bottom and 190 feet broad at the top of the Dam. There is a tunnel through it for scouring out the silt. This is done every four years by cutting away the timber which closes the tunnel on the upper side. The silt deposit is usually 40 to 50 feet deep.

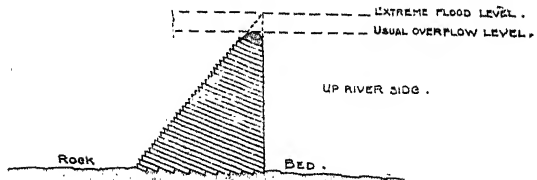


Up to 1853 there was very little scientific knowledge bearing on the construction of masonry weirs and dams, but in that year the investigations of French engineers gave a key to the laws governing the successful design of them, and since then great progress has been made. Of famous modern structures, the American Bear Valley Dam may be mentioned. It is built of masonry, curved with a radius of 335 feet, with the convex side up stream. The total height is 64 feet, the thickness at top 3 feet, and at 48 feet below the top the thickness is only 8 feet 6 inches. Fig. 2 shews a section of Bear Valley Dam. The success of such



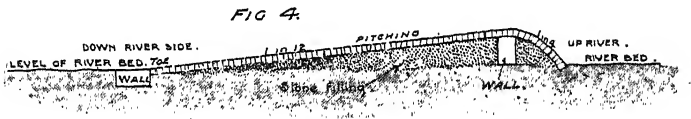
a thin structure is accounted for chiefly by the curved form of the dam, which transmits a great part of the pressure to the rock cliffs on both sides of the site. Fig. 2a.

Modern masonry dams and weirs on *rock formations* are built of "triangular" section, that is, the up-river side is vertical and the down-river side stepped or sloped back from the greatest thickness at base; at such an angle as to intersect the line of the up-river side at the greatest height at which flood water is expected to pass over it. The thickness at base being equal to a



little more than two-thirds the *extreme height* of floods. This section gives the greatest strength possible for any given amount of masonry and is generally used by hydraulic engineers, slightly modified in each case to suit the special circumstances. The latest example is the new Croton Dam, in America, the biggest in the world, 301 feet greatest height, base thickness 216 feet, top thickness 22 feet.

Diversion weirs of loose stones covered with a layer carefully packed have been extensively used where: (1) rock formations were unobtainable; (2) the fall in river was slight, that is, the water velocity was low; (3) stone was abundant; (4) unskilled labour plentiful, but skilled (mason's) labour expensive or scarce; and (5) where the height the water had to be raised did not exceed 8 or 10 feet. To ensure complete success, such structures must be (1) square to the current; (2) massive; (3) present a smooth surface to water, over which it can glide without getting a hold of the stones. They usually have a thin wall (3 or 4 feet) down through them from the top to prevent the upward pressure of the water "blowing them up" from below. There should be a broad,



shallow wall at "toe" on down river side to support the lowest stones and prevent their being washed away. Where river bed is clay, the stone filling is sometimes replaced by well tramped clay, which should have a few inches of fine gravel over it before the stone "pitching" is laid: the up-river slope should then be flatter.

Owing to the cost of wood in this country, timber weirs, so common in America, are not likely to come into general use here. The earliest historic record of water storage for irrigation is by earthen dams. India and Ceylon have many thousand such reservoirs, some of them of immense size. "The Veranum Tank" has an embankment 12 miles long and a water area 40 miles in circumference. Modern practice generally gives a slope of 2 feet horizontal to 1 foot vertical on the down-stream side and 3 feet horizontal to 1 foot vertical on the submerged side, with a top breadth of not less than 10 feet. 60 feet is generally considered the extreme height for earth dams, but they have stood successfully when 100 feet in height. Outlets should, whenever possible, be cut out of the hill at each end of the bank in preference to being left in the newly-formed bank. "Good dam-making ground," as the farmers term it in this country, is of course best, but where it

cannot be obtained in large quantities, embankments are frequently made of ground, etc., through which the water would readily percolate, but waterproofed by a few feet of fairly impervious ground laid over the up-stream side.

Trained Lady Helps for Farming.

During last year we drew attention to the work being carried out at the Swanley Horticultural College, Kent, England, where ladies are being specially trained as assistants in farm work with the object of taking up appointments in the colonies. We again draw attention to this institution and to the fact that the services of these trained ladies are available if any of our more progressive colonial farmers can find employment for them. They include specialists in dairying, poultry-keeping, bee-keeping, fruit culture, and general gardening and other branches, and would doubtless be a great acquisition where these industries are followed. In a country like this where coloured labour plays so large a part in farming operations those responsible, very naturally, are more inclined to favour the employment of men. But there must be many farms in this colony where the assistance of a capable, well-trained woman would be of the utmost value in supervising a small dairy with poultry and fruit on a medium scale. Anyone desiring further particulars should communicate with the Editor.

Wild Cotton.

A correspondent writing from Cofimvaba says:—The interest now taken in cotton growing leads me to point out that on the banks of the Tsomo River in this district are Wild Cotton plants growing with their roots and in many instances half the plants submerged in water. When I last saw them in March they were covered with pods about the size of a large acorn and still green. I notice another variety growing wild in our Government plantation on dry poor lands. Some years ago in Port Elizabeth there were large patches of Wild Cotton growing just inside the belt of bush dividing the drift sands from the Walmer commonage. This was a very good place for quail who used to feed on the seed. This latter was growing on very shallow soil and sand overlying limestone.

False Packing.

A correspondent in the Eastern Province calls our attention to the following in the private produce circular of a large firm of merchants engaged in business on the Border: "Forage has hardened slightly of late, but, owing to so much bad, and even fraudulent, packing, only guaranteed parcels can be sent away without fear of recurrence. We wish that our remarks from time

to time with regard to "get up" of all produce would bear fruit, but we regret to state that wool, mohair, grain, skins and forage are all brought to market in as bad condition as 20 years ago. Only this week we found a lump of locks weighing 13 lb. in a part bale of otherwise good mohair. A customer complained of a low price for a bag of hair (10½d.), but in the bag, mixed up in the fleeces, were, not the ordinary impurities only, but lumps of kraal. The millers complain this year, more than previously, of the dirt and pebbles in wheat. Forage, barley, oats, would be more valuable to us as district crops if condition could be relied upon, but when all are faulty, good business is lost all round." To this our correspondent adds: "This has been sent to me as one of this firm's customers. I can bear them out further. In potatoes: I have had this season new potatoes delivered to me and upon looking into the bags have found as much as nearly a quarter of the bag small potatoes the size of small marbles." So long as producers are guilty of this kind of thing they must not be surprised if their markets are poor and uncertain. The fault really lies with the buyers. If they would strictly refuse to deal with people found guilty of false packing the evil would soon cease.

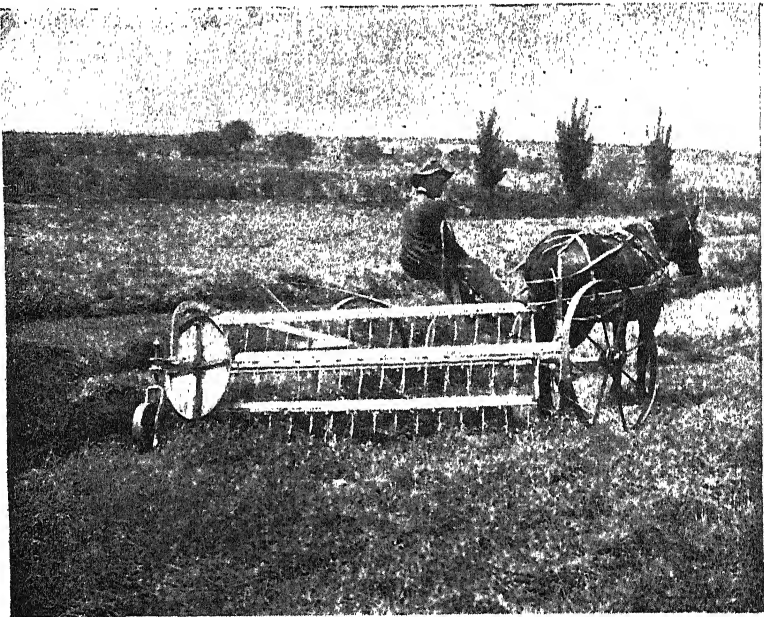
International Agricultural Congress, Vienna, 1907.

Since the year 1899 the *Commission Internationale d'Agriculture* has organized agricultural congresses. The eighth of these is to be held in Vienna from May 21st to May 25th, 1907. To carry out the preparatory work, an Executive Committee has been appointed, composed of Prince Karl Auersperg, President of the I.R. Agricultural Society in Vienna; Prof. Karl Portele, Counsellor in the I.R. Ministry for Agriculture; Franz von Pirko, Vice President of the I.R. Agricultural Society; Count Leopold Kolowrat-Krakowsky, Chairman of the Farmers and Foresters' Club; Friedrich Strohmer, Counsellor, Head of the Chemical Office of the Central Union for Beetroot Sugar Industry; Dr. Karl Hoffmeister, Vice-Secretary, and Dr. Heinrich Friess, landed proprietor and factory owner. The questions intended for discussion will be submitted to special sections. The office of the Congress has been opened in the building of the I.R. Agricultural Society. Particulars concerning the Congress may be obtained of Prof. Josef Häusler, Secretary to the I.R. Agricultural Society in Vienna, I. Schauflegasse 6.

FARM AND VELD.

Hay Collector for Lucerne.

Among the implements exhibited at the last Oudtshoorn Agricultural Show was a very ingenious hay collector. It is on the principle of a revolving rake, but seems much more effective than most implements of this character. As the lucerne lies after mowing on the field, the collector gathers it up into windrows by passing two swathes on to the third. By turning back, two more swathes can be lifted on to the windrow from the other side, thus gathering five swathes into one windrow ready for cocking or



gathering into stacks. An advantage is that the land is left clean and that no hay is wasted. The implement is so light that one horse can manage it. The rakes revolve in the reverse direction to the wheels. Similar machines, on the same principle are in use in other countries but this seems to be new to South Africa. It is an excellent labour saving device and should suit our dry climate. Mr. W. Thomas of Oudtshoorn introduced it, and the illustration herewith shews it at work in a lucerne field in that district.

Artificial Fertilizers for Citrus Trees.

Mr. P. K. Albertyn, of Lamloch, Bot River, writes: "Can you or anybody else tell me the best artificial manure for orange

trees? By experience I know well-rotted stable manure answers well, but I have not sufficient. My farm is along the coast, with a deep, sandy soil. Will not bone meal do, and what quantity?"

The whole question of the manuring of citrus trees opens a very wide field. In other countries where citrus fruits are largely produced the experiences vary very much, and the same happens in this country. In California, for instance, the use of stable manure has been followed by satisfactory results, but in Florida, according to Prof. H. H. Hume, "its use has too frequently been followed by attacks of die-back and by other troubles." The reasons he gives for this is the notorious deficiency in potash in the Florida soils, and as stable manure is essentially a nitrogenous fertilizer he urges that whenever it is used for citrus trees it should be accompanied by heavy applications of potash, unless the soil is already rich in this substance. An additional supply of phosphoric acid may also be needed, and for this bonemeal has been found effective.

The question of fertilizers has always to be considered from the point of view of the proportions of plant food needed. The three main constituents are phosphoric acid, potash, and nitrogen, and the question to decide is how best to supply these constituents in the quantities needed. In the case of citrus fruits, Prof. Hume states, this is most important, as they reflect the food supply. They may be thin-skinned, heavy and juicy, through the use of the proper materials and the very flavour may be influenced by the proper materials used as fertilizers. On the other hand, they may be thick-skinned, full of rag, insipid, and lacking in character, owing to the use of poorly balanced fertilizers. The tree itself may come to an untimely end through the persistent use of rank organic sources of nitrogen. In elaboration of this he gives the following particulars of the functions of phosphoric acid, potash, nitrogen and lime in their relation to citrus growing.

Phosphoric Acid.—This substance is a very essential one and plays an important part in the life activities of plants. It enters into the formation and is a constituent of a certain class of nitrogenous compounds known as proteids. Phosphoric acid is found in considerable amounts in the different parts of the fruit of citrus trees, but the seeds contain the highest percentage. The fresh rind of pomelos contains .035 per cent.; the pulp .044 per cent.; and the seeds .315 per cent. and these percentages may be regarded as close approximations for all citrus fruits. Unless the requisite amount of phosphoric acid be available, the fruit does not develop normally, and the maturity of the fruit is somewhat hastened by heavy applications of this material, unless offset by an abundant supply of nitrogen.

Potash.—In the formation of starch, sugar, fruit and woody parts of the tree, potash plays an active part. By photosynthesis, starch is formed in the leaves as a solid substance. Before it can be transferred to the different parts of the plant, it must be dissolved. Potash assists in this process, thus enabling the starch to pass through the cell walls of the plant. Sugar is probably formed from starch, and various other related compounds in the plant which enter so largely into the composition of the wood and fruit are probably derived from the same source. The great importance of a goodly supply of potash can thus be easily understood. If large amounts of potash are taken up by the trees it will be found that the rind of the fruit will be much thinner than otherwise and the amount of rag will be greatly lessened. A plentiful supply of potash in the fruit has an excellent influence on its keeping quality. If too little be present, the fruit will be soft and is likely to break down shortly after removal from the trees. To increase the keeping and carrying quality of citrus fruits a large amount of potash and a small amount of nitrogen should be used. The influence of potash on the hardening of the wood is worthy of note. Trees plentifully supplied with potash are more likely to form firm, hard wood, less liable to damage by cold and the attacks of insects than if a preponderance of nitrogen be applied.

Nitrogen.—The effects of an abundant supply of nitrogen are much more apparent than the effects of an excess of either potash or phosphoric acid. When the leaves have a dark green, glossy colour they are receiving plenty of nitrogenous food. The effects are further shewn in the increased area of individual leaves, strong, vigorous, sappy growth and long internodes. Very large amounts of nitrogen impair the fruitfulness of the tree, wood formation taking place at the expense of fruit. It has a tendency to retard the maturity of the fruit and large amounts materially increase the amount of rag and the thickness of the rind. On the other hand, when the nitrogen supply is not sufficient, the leaves become yellow, the trees have a stunted, starved appearance and do not make a normal growth of branch and leaf.

Lime.—The value of lime as a fertilizer may be viewed from two points: its effect upon the soil and its effect upon the plant. Both of these have a direct bearing on the subject under discussion. Much of the fertility of the soil depends upon the number and activity of soil bacteria. These liberate plant food and make it available, so that the roots of trees and other plants may take it up. Soils, especially in warm climates, have a tendency to become acid, and under such conditions the bacteria cannot live. The presence of lime counteracts the acid condition, and it should be applied when necessary. Furthermore, it helps to bring about the decomposition of humus, and liberates the nitrogen which it con-

tain. Large amounts of plant food may be liberated by or through the use of lime, hence, in applying it to citrus groves, it is best to use it sparingly, or, at the time of its use, discontinue the nitrogenous fertiliser, and depend upon the amount of nitrogen liberated to make up the deficit. In the plant, the presence of lime appears to favour the formation of stronger cell walls, and thus aids in making the trees stronger and more sturdy. Citrus trees planted on soils fairly well supplied with lime have a tendency to mature their fruit somewhat earlier, and the fruit is bright and clean.

Formulas.—Various brands of fertilisers for use on citrus trees are placed on the market, but in these brands the cost per unit of plant food is greater than in the raw materials. The greatest difficulty is in securing a uniform mixture, but if sufficient care be exercised, this may be overcome. Many growers prefer to have the dealer, from whom he secures his raw materials, mix them for him. If the dealer can be relied upon to do the work right, this plan has much to commend it. But good, uniform mixtures can be made at home, as has been demonstrated time and again. For home mixing of fertilisers a strong box, with smooth sides and bottom, sufficiently large to contain from 500 to 1,000 pounds, should be provided, or the mixing may be done on a tight, smooth, board or cement floor.

Young and old trees differ in their fertilizer requirements. Young trees use their food supply in the formation of wood and leaves. For the first two or three seasons they grow vigorously. When the bearing period is reached, a gradual change comes about; the trees do not grow so rapidly, and a large portion of the food supply is diverted to fruit formation. The demands on the trees being different, the food supplied should be different in character. Young trees require a large amount of nitrogen, while bearing trees require less nitrogen relatively, and more phosphoric acid and potash.

For young trees the fertilizer should contain about 6 per cent. phosphoric acid, 8 per cent. potash, and 4 per cent. nitrogen; while one containing 8 per cent. phosphoric acid, 12 per cent. potash, and $3\frac{1}{2}$ per cent. nitrogen should be applied to the grove of bearing trees.

In applying fertilizer to young trees it should be scattered in a circle of four or five feet radius, or more, depending upon the area covered by the feeding roots. None should be applied closer than two feet from the tree as injury may result to the crown roots. Fertilizer for large bearing trees should be scattered broadcast through the grove. After application the ground should be cultivated. The fertilizer is generally applied some little time before growth starts in the spring, and again about four months later.

Snails and Caterpillars in Lucerne.

Mr. J. H. du Plessis writes from Meiring's Poort, Oudtshoorn :—May I trespass on your kind indulgence in a matter that is of great consequence to all our local farmers? Firstly, I notice that on several of the lands just sown with lucerne seed there are enormous quantities of snails, and that as soon as the young lucerne plant sprouts, it is eaten by these snails; in fact, large patches of the lands are quite devoid of lucerne in consequence. Secondly, as soon as spring sets in caterpillars appear again, and absolutely render the old lucerne valueless for fodder. Many farmers either cut the lucerne then or graze the ostriches on such lucerne; but in either case it does not do away with the pest. I tried spraying lime water, also sowing the pure lime over the caterpillars, but could see no improvement.

When the lucerne is mowed, the caterpillars migrate in their thousands to the adjoining field, and there continue their work of destruction. Will you be good enough to give or suggest a remedy, and a cheap and easy one, owing to the large extent of these lucerne camps, for one or both of the abovementioned pests. I shall do my best to follow out your suggestions, and will communicate on the result, in order that it may prove of some help to other farmers.

Mr. C. P. Lounsbury, Government Entomologist supplies the following memo. on the subject which has been forwarded to Mr. du Plessis:—"If the dressing of lime which you say you applied against the caterpillar pest had been given to the snail infested fields, you probably would have got a fair measure of relief from the latter pest. I have not seen nor heard of any grower using any measure against snails in lucerne fields, but a liberal application of lime around and over the plants to be protected is the most widely used means of minimizing the injuries by snails and slugs in flower and vegetable gardens. Arsenical poisons may be used for the purpose though this does not seem to be generally known. One florist in Cape Town has employed Paris green for several years, freely treating even flower seedlings, and his experience is that the results are far better than with lime or salt. Though he uses a very dilute mixture, about a pound to four hundred gallons, he finds that the snails and slugs are soon fatally poisoned. In the case of sprouting lucerne, the laying of "baits" as for mestwurmen would probably be superior to spraying. If spraying is tried the best arsenical to use is arsenate of lead as in this form the arsenic should not injure the plants. It is well to use a strong mixture, say at least one pound to twenty-five gallons of water. For baiting, white arsenic, procurable at any chemist's, or scrub exterminator, that is arsenite of soda, might be tried as injury to

the plant is not then a consideration. A preparation of an ounce or two to four or five gallons of water should be made and this used to wet thoroughly some freshly cut lucerne which should then be distributed in little piles, say about five yards apart, over the infested fields. The baits should be laid late in the afternoon so as to have them fresh for the night, and when possible the work should be done before the lucerne is up. A second baiting, after two or three days, may be sometimes advisable. One need not fear that any animal might get poisoned by spraying young lucerne as suggested, but the far more heavily poisoned baits should all be gathered and burned when they are too dry to be of any further use. I have not seen strong arsenite of soda used as a poison for snails or lucerne caterpillar, but presume they would take it, our migratory locusts do not refuse grass poisoned with it, nor are certain beetles fastidious. The insoluble arsenical poisons, like Paris green and arsenate of lead, seem to be more readily accepted by some insects than soluble forms like soda arsenite.

"The problem of lucerne 'caterpillar' is no new one, but one that confronts the lucerne grower all over the Colony. The subject of measures for the control of the pest might well be discussed by the newly formed Lucerne Growers' Association. The caterpillars are not exclusively of one kind. The most common sort is the larva of the yellow butterfly (*Colias electra*) which is often so abundant over the fields; but at times the larva of a moth (*Heliothis armiger*) also gets very troublesome. The butterfly larva is yellowish-green in colour, and tapers somewhat towards the hinder end; while the moth larva is variously coloured but generally dark, has a number of more or less distinct pale, narrow stripes and glistening black tubercles, and is of much the same diameter throughout. The moth larva grows to be much the larger of the two. I seek to distinguish between the two kinds because remedial measures which might be used would not be equally effective against both. The *Colias* is a native insect and it appears to feed only on lucerne and closely allied plants such as the burr and other clovers. In most parts of the Colony the food supply is doubtless very limited outside of the lucerne fields. The *Heliothis* is almost a world-wide pest, and one that has numerous food plants amongst cultivated crops. From the published records it seems to trouble lucerne more at the Cape than has been observed elsewhere. It is "the risper" in the Western Province, and it is well known for its boring into early tomatoes, peas, peaches, and flower buds and for destroying the young growth of fruit trees and vines, and eating the kernels off young cobs of mealies. It seems to have greater "ups and downs" than the *Colias*, some years being far more abundant than others. In most parts it is probably able to find plenty to live on outside of the lucerne fields.

“ Notwithstanding its inadequateness, the premature cutting or grazing off of badly infested fields is probably by much the best measure that can be used for the control of the caterpillar pest. To get the maximum benefit out of the remedy, however, it is undoubtedly essential that it be practised with some system by all the lucerne growers in any given area, the object being not alone to save the infested lucerne, but to effect the destruction of the caterpillars. The neighbours will benefit by the destruction of the caterpillars almost or quite as much as the owners of the field, for the butterflies or moths which would result were the caterpillars to live, would very likely fly to other farms to lay their eggs. Particularly as regard the *Colias* which appears to depend so largely on lucerne for its subsistence, it should be the aim of a community of lucerne growers to choose the most opportune time during the year and then to strike a decisive blow against the pest all together.

“ The migration of the pest from mowed lands to adjoining fields can surely be prevented by some practical means. Specially cut trenches, water-filled ditches, and boards stood on edge and besmeared with coal-tar are successfully used in staying the march of other kinds of caterpillars to cultivated lands. Spraying is well worth trying if animals can be kept off for a short time. A strip of the lucerne a few yards wide should be left uncut all around the border of the field, and, in the case of large fields much narrower strips the length of the field here and there; and these strips well treated with strong arsenite of lead and then left for a week or ten days, after which they should be mowed off and burned. As slight injury to the plant foliage would be of little consequence, Paris green or arsenite of lime could be used to substitute the lead compound if the latter were not conveniently procurable.

“ It may be of interest to mention that both the *Colias* and the *Heliothis* caterpillars, in common with other kinds, are subject to a bacterial disease which clears them off wholesale at times, the blackened and flaccid bodies of the victims becoming quite noticeable amongst the lucerne tops. But such poor success has been met with in attempts to utilize other insect diseases that there is little room to hope that this can be turned to profitable account. However, the writer promised the Executive of the Oudtshoorn Fruit Growers' Association a few months ago that he would pay some attention to it when it next came to his notice, and he was more recently informed by the Transvaal Entomologist that the Transvaal Agricultural Department has the disease under observation. Cultures for trial at the Cape are promised.”

EXTRA-TROPICAL FORESTRY.

Being Notes on Timber and other Trees cultivated in South Africa and in the Extra-Tropical Forests of other Countries.

By D. E. HUTCHINS, F.R. Met. Soc., Conservator of Forests,
Cape Town.

(Continued from page 783, Vol. XXVIII.)

NITROGEN.

This is the most important of the Agriculturist's manures. It is the chief constituent of guano. It is of less importance to the Forester who does not seek a rapid forced growth except where it is of the first importance that the planted tree should rapidly dominate the rank ground-herbage. Here a bushel or two of guano to the acre, a pinch to each tree, may give the tree a fillip that will save one or two expensive cleanings. A bushel of guano costs 4s. 3d., which is less than half the cost of hand cleaning per acre in dirty ground.

I much prefer, however, to stimulate this first growth with finely ground bone ash, using a small handful to each tree. There are about 1,000 small handfuls of bone-meal to a sack, and a sack of bone meal weighs about 200lb., and costs four florins; so that the cost of manuring 1,000 trees with bone-ash amounts to only 4 farthings per ten trees or 0.4 farthing per tree.

When ground round young trees has the sods inverted or is otherwise well cleaned, the young tree is profited in three ways:—

- (1) The drain of weeds on soil-food and moisture (specially the latter) ceases.
- (2) The green stuff turned in acts as a nitrogenous manure. The agriculturist obtains the same result when he puts in a catch crop and ploughs it in green.
- (3) The weeds, if laid over the roots of the young trees, form a mulch.

After what has been said above under Humus—the forest soil, little remains to be added under Nitrogen, the fertiliser; of first rate value, though it is, as a fertiliser. Atmospheric air consists of a mixture of four-fifths Nitrogen and one-fifth Oxygen with very small quantities of other gases so that the plant in a soil poor in Nitrogen is like the ancient mariner: "Water, water everywhere, but not a

drop to drink!" Plants can only use Nitrogen when it is in a state of chemical combination, usually in the form of Nitrates. Chili Saltpetre, an impure Nitrate of Soda, is the most common Nitrogen manure in Europe, Guano in Cape Colony. Foresters have usually only to do with artificial fertilisers for Nitrogen when they grow their own oathay or other fodder.

It is generally cheaper to buy oathay than to grow it. However near Ceres Road on the farm Knol Vlei, purchased for a Railway Sleeper Plantation, it has been found economical to grow oat-hay on land not yet reached by the planting operations. During the last three years 268 tons of oathay have been thus produced. The soil is rather below the average fertility of the Tulbagh Valley. The average quantity of guano used was half a sack of guano to every sack of oats sown: on rich loamy ground, one-third of a sack of guano to every sack of seed oats. No dung was employed.

Sometimes a poor soil containing inert Nitrogen can be stimulated to activity by the use of other fertilisers, such as ground bones, basic slag, and wood-ashes. In this way sufficient crops can be got off the ground till it is embraced by the planting operations and the ground is then left permanently enriched for tree-planting instead of exhausted as would be the case if guano had been used. This was the plan followed with the lower portion of the Tokai arboretum, with the result that exacting trees such as the Ash, now grow markedly better there than elsewhere.

Analyses of typically fertile soils shew very varying quantities of assimilable Nitrogen, and analyses of fertile Colonial soils shew that in the Extra-tropics less Nitrogen is necessary than in colder wetter climates. Apparently the more abundant sunshine in South Africa takes the place of the stimulus afforded by the abundant free Nitrogen to which the European Agriculturist is accustomed. Mr. Juritz's analyses have shewn further that average samples of Colonial oathay are richer in albumenoids than European oat hay. According to H. Ingle (*Transvaal Agricultural Journal*, January 1906), in England, average fertile ploughing land contains from 0.2 to 0.4 per cent of combined Nitrogen. In the Transvaal, good crops are yielded by land containing only 0.1 per cent. of Nitrogen. His caution against indiscriminate burning is thus expressed:—

Since Nitrogen is the most valuable and costly ingredient in manures, every effort should be made to restore waste nitrogenous material to the soil. Vegetable and animal matter should be carefully preserved on the farm and after rotting should be applied to the land, and while it may be necessary sometimes to burn noxious weeds, &c., in order to prevent their growing, the destruction of vegetable matter by fire should be avoided as much as possible, since during combustion, the nitrogen of the organic matter is mainly set free, escapes into the air, and is thus lost for agricultural purposes.

"The burning of veld grass is a practice greatly to be condemned from this point of view, since it leads to the destruction of much valuable combined nitrogen. At the same time, too, it destroys the bulky carbonaceous matter of the grasses, which, if it could be restored to the soil would greatly improve the physical properties, *e.g.*, porosity, water-retaining power, etc., and as has been shewn recently, would favour the action of the micro-organisms in the soil, some of which have the valuable property of absorbing free nitrogen from the air and building it into compounds which can be utilised by plants."

DR. HAHN ON NITROGEN IN CAPE COLONY.

Nitrogen is absorbed in the form of Nitric Oxide and of Ammonia. The large quantities of Nitrogenous compounds in the solid and liquid excrements are, for the farmer in this country, the only source from which the Nitrates and Ammonia compounds can be derived, which all crops require in considerable quantity. These compounds of Nitrogen are the most expensive of all the constituents of manure, and the price of manure is often made entirely according to the amount of combined Nitrogen which is contained in it. The supply of combined Nitrogen which we have in guano is very limited, and the majority of the farmers cannot depend upon this supply. The only means which they have for obtaining these absolutely necessary constituents in their manure is to collect carefully the excrements in stable and kraal, to mix them with ashes and vegetable matter, straw, leaves, etc.,

Manure prepared in this way, has, however, a great practical advantage over guano, because it contains, besides Nitrates and Ammonia compounds, also all other mineral constituents which must be supplied to the plants, whereas guano is not of such a comprehensive composition, and it is known that guano will produce one or two crops, and then leave the lands in an exhausted state. (Dr. Hahn, in *South African Agricultural Almanac*, 1888.)

NITROGEN IN RAIN-WATER.

"Plants depend for the Nitrogen, which is so indispensable and important for their growth, chiefly upon Nitrates absorbed by their roots and rootlets from the water in the soil. A large portion of the Nitrates present in soil water is derived from the decay of organic Nitrogenous matter contained in the soil, but the soil obtains a not unimportant amount of combined Nitrogen from the rain which falls upon it. In Europe, many careful examinations of rain water have been made. In England a large number of determinations of the combined Nitrogen in rain water shew that about 2.82 pounds of Nitrogen in the form of Ammonia and 0.92 pounds in the form of Nitrites and Nitrates, or a total of 3.74 pounds are annually brought down by the rain upon each acre of soil. On the European continent the amounts are larger, a mean of seven series of determinations, about 1870, yielding an average of 10.18 pounds of combined Nitrogen per acre, per annum.

"The writer has arranged for the measurement of the weekly rainfall in Pretoria, and the determinations of the Nitrogen present as Ammonia and as Nitrites and Nitrates. The investigations commenced on February 1st, and the results will be published in full hereafter. Already, it may be stated, that there are indications that the amount of combined Nitrogen present in the rain here, even during the recent heavy rainfall, is greater than in England,* so that

* The total amount of combined Nitrogen brought down in the rain at Pretoria during February and March was almost exactly 2 pounds per acre.

vegetation probably receives proportionately greater assistance from this source."

H. INGLE in *Transvaal Agricultural Journal*, April, 1904.

LOSS OF NITROGEN FROM RAIN.

Nitrogen is generally the most difficult constituent of a fertile soil to maintain. Broadly speaking, when farmyard manure is drenched with water, it is the Nitrogen that is lost. Every drenching rain, such as is only too common in the Cape Peninsula in winter, in washing out the nitrogen robs the fertile garden soils of their fertility and strength. Hence in Cape gardens the continued necessity for re-dunging, the advisability of dunging late in winter, and of keeping the dung stored out of the rain. Hence also the advantage of the old Cape plan of sowing orchards with green barley. The green barley is sown early in winter and thus saves the Nitrogen. At Rothamstead "there was about two and a half times as much Nitrogen washed out from the bare soil as from the soil upon which wheat was grown." (Freem.) The up-country drenching rains coming with thunderstorms, are not quite so bad for the rich soils. They give a little return of Nitrogen in the form of Ammonia which has been formed in the atmosphere by electricity.

In experiments conducted at Rothamstead, England, it was found that the mean yearly loss of Nitrates escaping through drains fixed at varying depths was 41.81 lbs. per acre which is the amount of Nitrogen contained in 268 lbs. of ordinary Nitrate of Soda. "Supposing—and this is a fair and reasonable supposition—that the drainage water contained at the same time 0.5 part of Nitrogen per million in the form of organic Nitrogen and Ammonia, this gives a total of 43.77 lbs. as the quantity of Nitrogen removed in one year, from an acre of uncropped soil, in drainage water which amounted to 17.281 inches. Such a quantity of Nitrogen is equal to that contained in an average crop of wheat or barley; its loss to the soil in the drainage water is thus a matter of grave importance" (Freem). In most parts of the Cape Peninsula the drainage water during an average winter amounts to a good deal more than 17 inches, and the loss of Nitrogen from fallow ground would be greater.

The loss of Nitrogen washed out from the soil varies according to circumstances. The loss is naturally less from clayey, from humus, and from other retentive soils. Salts, too, vary. Nitrates are more easily leached out than Ammonia.

GUANO.

Guano has been used in enormous quantities to supply the high quantities of nitrogen used in British Agriculture. It is essentially a nitrogen manure. Being an evanescent fertilizer it is not suited to forest work, but it has often to be used when taking a crop of oats off dirty ground that is being got ready for tree-planting or when it is profitable to grow forage for the transport animals. Guano may sometimes also be used to advantage as a stimulant to get the heads of young trees above bush or ground-herbage. In

this case its cost is set against that of extra cleanings. Guano is largely used for the grain crops in the west of Cape Colony, but on very poor soils it sometimes has an exhausting effect and has been known to cease to act in 2 or 3 years.

It should be noted that the best guano is a highly nitrogenous fertilizer, but the inferior guanos, especially those that have been somewhat leached, contain relatively more Phosphates and Potash. The Peruvian Guano of some years back so rich in Ammonia is now scarcely obtainable. Such guano contains up to 12 per cent. of Ammonia. The poorer grade guanos contain only about 4 per cent. or less of Ammonia but 30 to 50 per cent. of Phosphates and perhaps 1 to 3 per cent. of Potash. In price and Phosphates they are similar to fine bone-meal. They are far more suitable for forest purposes than the guanos rich in Nitrogen, and some Agriculturists hold them more suitable for agricultural crops in dry countries such as most of South Africa and Australia and much of North America.

Bat guano exists in small quantities in caves round the coast of South Africa and is a very valuable though variable fertilizer. I think the finest potatoes I have ever seen were raised with bat guano at Knysna. It sometimes contains as much as 9 per cent. of Nitrogen and 25 per cent. of Phosphoric Acid (Aikman).

In Germany the carcasses of horses and dogs or of cattle when they have died of disease are converted into guano by steaming and thus separating the fat and gelatine. This so-called guano contains from 6 to 10 per cent. of Nitrogen and from 6 to 14 per cent. of Phosphoric Acid. Here one sees the value of a carcass buried whole under a tree and why the common Cypress grows so much better in a church-yard than on the veld.

ANALYSIS OF GUANO.

The following analyses of the guano supplied by the Cape Government, are instructive. They seem to shew that the Rock Guano is to be preferred to the ordinary, but if one can be certain of obtaining guano containing as much Phosphates as that termed here No. 3 Ordinary, it will be the best to use for trees. For its price the Government guano is undoubtedly the cheapest Nitrogen fertiliser, in fact the value of its Nitrogen alone is equal to about what is charged for the guano, viz., ordinary guano £6 10s., rock guano £6 17s.

The subjoined report on the analysis of four samples of guano from the Government Islands is published hereunder, viz.:—

		Lime.	Potash.	Nitrogen.	Phosphoric Oxide.		
					Total.	Soluble in water.	Soluble in citrate.
No. 1.	Ordinary Guano..	8.97	2.12	12.14	9.80	4.68	9.62
„ 2.	Rock ..	11.37	2.03	13.42	11.22	3.33	11.04
„ 3.	Ordinary ..	16.89	1.49	7.48	16.95	3.85	13.62
„ 4.	Rock ..	11.90	2.17	12.36	11.56	3.57	10.83

The values of these samples have been calculated, for this Colony, upon the basis of the following unit values :—

Nitrogen	..	..	..	..	..	s.	d.
Phosphoric Oxide (soluble in water)	..	..	..	..	..	5	10
Phosphoric Oxide (soluble in citrate solution)	..	..	..	..	..	5	5
Insoluble Phosphoric Oxide	..	..	..	..	..	2	1
Lime	..	..	..	..	..	0	10
Potash	..	..	..	..	..	5	5

Estimated by this scale the money values of the fertilisers above mentioned work out as follows :—

				No. 1.	No. 2.	No. 3.	No. 4.
				£ s. d.	£ s. d.	£ s. d.	£ s. d.
Lime	..	..	..	0 7 6	0 9 6	0 14 1	0 9 11
Potash	..	..	..	0 11 6	0 10 11	0 8 0	0 11 9
Nitrogen	..	..	..	6 1 5	6 14 2	3 14 10	6 3 7
Phosphoric Oxide	Soluble in Water	..	..	1 7 4	0 19 5	1 2 6	1 0 10
	Soluble in Citrate Solution	..	..	1 6 9	2 1 8	2 12 11	1 19 4
	Insoluble	..	..	0 0 9	0 0 9	0 15 3	0 3 4
				£9 15 3	£10 16 5	£9 7 7	£10 8 9

The above determinations were made in the product obtained by sifting the samples through a 1 mm. sieve. Of this product the samples contained the following percentages :—

No. 1	..	..	..	91.58
„ 2	..	..	..	87.10
„ 3	..	..	..	84.78
„ 4	..	..	..	92.35

Owing to the fact that only a portion of the fertilisers are in sufficiently fine condition to be readily available, a reduction in the above values must be made. In this way the following values per ton are obtained, viz. :—

No. 1	..	..	..	£8 18 9
„ 2	..	..	..	9 8 6
„ 3	..	..	..	7 18 6
„ 4	..	..	..	9 12 9

A. J. J. B. SIMONS, *Analyst*.

ATMOSPHERIC NITROGEN.

Of course, no one will confound the free Nitrogen of the atmosphere with the Nitrogen in chemical combinations that plants require. It is the difference between the pure white metal Aluminium and the clay on one's boot. Only under very special circumstances can plants lay hold of the abundant and all pervading Nitrogen of the atmosphere. It is the fixed Nitrogen of chemical compounds that is understood when Agriculturists speak of Nitrogen as a fertiliser for crops.

Even the fixed Nitrogen, of chemical compounds is not always available as plant food. Humus and peaty soils contain vast stores of Nitrogen, but so combined that plant roots cannot take it up. Working such soils and exposing them to the air or dressing them with quicklime, or other chemicals, renders their Nitrogen available.

Thus, to resume, we have Nitrogen in three forms :—

- (1) The free Nitrogen of the air, useless to the plant directly.
- (2) The organic Nitrogen of vegetable soils in a dormant condition, to which the plant must be assisted—"uncooked food."
- (3) The soluble Nitrogen of urea, chemicals, &c. This is the most valuable form of Nitrogen ("the plant's cooked beef-steak;") but it is also that which is most easily lost.

ATMOSPHERIC NITRATES AND THE ZAMBESI FALLS.

It has long been known in the laboratory that the electric spark has the power of causing the Oxygen and Nitrogen in the atmosphere to enter into chemical combination as Nitric Oxide. From Nitric Oxide to Nitric Acid and Nitrates there is an easy chemical transition. Some of the fertilising effect of summer rain is ascribed to its coming with electric storms which tend to give it Nitrates in solution. Latterly, the laboratory experiment with the electric spark has been turned to practical account at places where power is going to waste, and can, without too great expense, be utilised as electricity, as at the Niagara Falls and at Notodden in Norway. The Notodden Nitrate factory takes power from the Tinnfoss waterfall. Projects are in hand for making Nitrate from three other waterfalls in Norway one of these being Rjukanfos, the largest fall in Telemarken. The Norwegian Nitrate is found, in practice to be as good as Chili Nitrate. It would be better than Chili Nitrate for all those parts of South Africa where brak gives any trouble, since Chili Nitrate is a Nitrate of Soda while Norwegian Nitrate is a Nitrate of Lime.

Nature has given South Africa one of the world's big waterfalls on the Zambesi. It remains to turn this power into fertility for South African lands by means of Nitrates. In 1892 as much as one million tons of Chili Nitrates were used, and last year, 1905, as much as one and a half million tons. Nitrates from the Zambesi would give to the large summer rainfall area of South Africa that fertility which the cornlands of the South-west now get from guano.

Sir William Crookes estimated (Presidential address, 1898) that the world's wheat-growing area will be fully occupied in about 30 years. Then wheat will get dearer and least of any country can South Africa pay more for bread. The ever-increasing demand for wheaten bread and foodstuffs will then be only met by increasing the productiveness of the cultivable land in all countries, and the most practicable way of doing this is with Nitrates.

THE SEWAGE WASTE OF NITROGEN.

In nearly all civilised countries an enormous waste of fixed Nitrogen and other fertilisers occurs with the discharge of the sewage into the sea. It is computed that sixteen million pounds worth (£16,000,000,) of fixed Nitrogen runs into the sea yearly with the sewage of the British Isles. Sanitary science seems powerless to prevent this waste. Thus every inhabitant of the British Isles

pays on an average 8s. yearly for wasted fixed Nitrogen, exactly as he pays 10s. for cigarettes, nearly £4 for alcohol, and 13s. 6d. for imported timber.

SUMMARY.

Though Foresters have rarely to trouble about Nitrogenous fertilizers, it being formed in sufficient quantity in the forest soil, it is so important an element of fertility, even in warmer climates, that all precautions must be taken not to waste Nitrogen :—

(1) *Never burn* unless you are compelled to, such as for fire protection, to clear the ground for planting, or in a nursery to get rid of specially noxious weeds.

(2) *husband the Nitrogen in your farm-yard Manure.* (a) By keeping it under shelter from heavy rain, wind, and sun. (b) Do not turn over farm-yard manure, but keep it trodden down close and compact as in a kraal. (c) Use farm yard manure *fresh*. The most recent and best opinion is in favour of using farm-yard manure fresh instead of well-rotted, as has long been universally recommended. (d) Collect the urine and throw it daily over the solid dung. If allowed to collect, as in a dirty stable, and give forth Ammonia that is so much lost Nitrogen.

THREE NATURAL NITROGENOUS FERTILIZERS.

In the South African forest there are three natural fertilizing agents that often act powerfully, more especially in the damp indigenous forest of the mountains. These are (1) Earthworms, (2) Ants, (3) Symbiosis.

EARTHWORMS.

On the Amatolas, especially about Evelyn Valley where the rainfall runs up to 100 inches in good seasons, enormous earthworms of the size of small snakes are met with. A smaller earthworm is more common. This is abundant throughout the mountain forest of the southern coast from the Amatolas to Swellendam. Frequently in the forest or in a damp glade of the forest, the ground is covered with casts of earthworms and the soil largely composed of their rich debris. At Grootvaders Bosch the ground is often covered so much with these worm casts (which get very hard in the dry weather) that it looks like a bed of marbles.

Earthworms seem to be abundant in all cool damp climates—on the Nilgiris in South India, and in Chili for instance. In his work on the earthworms of the British Isle, Charles Darwin gives some notable figures. He tells us that.—“On each acre of land which is sufficiently damp and not too sandy, gravelly or rich for worms to inhabit, a weight of more than *ten tons of earth annually* passes through their bodies and is brought to the surface.

In England and Scotland the land which is cultivated and is well fitted for earthworms has been estimated at above 32 million acres.—*Formation of Vegetable Mould* by Ch. Darwin.)

This calculation shews that England and Scotland get at least 320 million tons of fine vegetable mould from their earthworms. The calculation does not take account of the very considerable areas where the earthworms are at work in a less degree.

ANTS.

On the South African veld or open country the work of the earthworms in the forest is replaced to some extent by ants. When the veld is ploughed an ant heap always leaves its mark as a patch of fertile soil. Here the crop, be it agricultural or forest, shews a luxuriant patch. I have seen a ploughing of very sour mountain veld above Sir Lowry Pass where every crop *including Cluster-pine* failed, except here and there, where an ant heap had been ploughed over. A similar observation has been made by Mr. Legat the Conservator of Forests in the Transvaal, namely that where ant heaps are ploughed over there is a better tree growth. In the warmer parts of South Africa where white-ants (Termites) abound, they also are said to increase the fertility of the soil.

Mr. Herbert Ingle, Chemist to the Department of Agriculture, gives the following analysis of an ant heap (White-ant) and of the soil of the veld about 3 feet away near Christiana in the Transvaal.

	Ant Heap.	Veld Soil.
	Per cent.	Per cent.
Moisture ...	3.28	1.98
*Loss on ignition ...	13.03	4.14
Insoluble matter ...	74.59	82.86
Iron oxide and alumina ...	8.79	9.89
Lime ...	0.30	0.12
Magnesia ...	0.40	0.18
Potash ...	0.39	0.25
Phosphoric acid ...	0.06	0.06
Total ...	100.84	99.48
*Containing Nitrogen ...	0.343	0.080
<i>Available—</i>		
Potash ...	0.0432	0.0121
Phosphoric acid ...	0.0102	0.0017

The above figures indicate much greater fertility in the ant heap material than in the soil on which it occurs. The organic matter and Nitrogen are particularly noticeable, the latter being more than four times as abundant in the ant heap, while the "available" Potash and Phosphoric Acid are also much higher.

The superior richness of ant heap material in organic matter and Nitrogen is no doubt due to the glutinous material used by the insects in cementing the particles together, and possibly to the excreta of the ants. In many parts of an ant heap there are large quantities of the stems, etc., of grasses and other vegetable material, and though no actual vegetable matter was visible in the portion

analysed, products derived from its decay or its consumption as food by the insects may have been and probably were present. Its greater richness in other items of plant food, *e.g.*, Potash, and especially "available" Potash, is doubtless explicable in the same manner, since the green shoots of grasses, etc., used as food by the insects are usually rich in these mineral ingredients.

Crushed ant hills have been sometimes used for manuring vegetable gardens, besides their more common use for tennis courts and (when the grubs are in them) for feeding poultry.

SYMBIOSIS.

Under the general name of symbiosis (conjoint life) it is convenient to include all those forms of conjoint growth in which two vegetable organisms grow together and profit from the partnership. We may distinguish:—

- (1) Root nodules fixing the free atmospheric nitrogen.
- (2) Healthful fungi and bacteria at the roots of forest trees, both fixing atmospheric Nitrogen and rendering other plant foods easily assimilable by the roots—the "forest cooks" as they have been happily called.
- (3) Root parasitism, as the Sandal tree with the Lantana.

The free Nitrogen of the atmosphere.

Within the last few years the researches of a group of German chemists have proved that vegetation under certain circumstances has the power (contrary to what was held for many years) of fixing the free Nitrogen of the atmosphere.

This power is confined principally to plants of the Leguminous order. Pull up a lupin and the roots will be observed full of nodules. Herein lies their power of fixing Nitrogen. In this power of fixing Nitrogen lies the chief value of lupins for manuring. I have observed similar nodules in Wattle plants. Wattles not only flourish on the most sterile soils but produce every year abundant crops of Nitrogenous seed as well as barks rich in gum, starch, and tannin. They could hardly do this without the Nitrogen-fixing nodules. Again, in old established forests the fixation of Nitrogen has been shewn to be promoted by bacteria and fungi that flourish in forest soil. Such soils rich in humus and decaying vegetable-matter may be observed to invariably accompany the best forest growth. Without such soil it appears that the supplies of Nitrogen would be deficient.

Thus it appears that Wattles are especially fitted to enrich and transform a poor soil: to convert, say a sandy waste to a soil capable of a further conversion to the rich soil of a high-timber forest.

Mr. Pardy, Analyst to the Agricultural Department of Natal, recently prepared a culture from the nodules of Black Wattle. This has been applied to seedlings and one-year old plants, but it is too soon as yet to say what will be the result.

I have a collection of Wattle roots made on the Cape Flats that are sprinkled over with these nodules like beads on a string. Most of my specimen are either *Acacia saligna* or *A. cyclopis*. Mr. C. E. Legat the Conservator of Forests in the Transvaal has noticed similar nodules on the roots of indigenous leguminous trees in the Transvaal. Recently scientific agriculture has taken a great development in the artificial cultivation of Nitrogen-fixing bacteria. Cultures are sold which, added to the peas and beans of one's garden, double the crop. This was my experience with a bean culture obtained recently from Dr. Nobbs of the Cape Agricultural Department.

There is but one species of legume organism, *Pseudomonas radicola* (Beyerinck), Moore. The difference is the infective power of bacteria from different hosts is due to slight physiological variations which can be broken down readily by cultivation.

In order to increase or maintain the virulence of nodule-forming organisms they must be cultivated upon nitrogen-free media. Growth upon rich nitrogenous media tends to diminish and frequently destroys the nitrogen-fixing power, since this element can be obtained more easily from the medium than from the air.

Various external conditions, such as heat, moisture, alkalinity, amount of nitrogen in the soil, etc., all have a direct effect upon the legume bacteria, and the failures of nodules to develop may often be traced to such a cause.

The nitrogen is fixed by the bacteria in the nodule, and becomes available by the action of the plant in dissolving and absorbing the combined nitrogen in these organisms. (Natal Agricultural Journal 1905.)

NUTRITIVE FUNGI

Many species of forest trees flourish best when growing in the forest along with certain fungi. Many species of Oak, Willow, Poplar and Pine require the help of a fungus at their roots to enable them to shew their best growth.

The fungus assists the roots in getting nourishment out of the earth. The forest soil may very commonly be seen full of white fungus threads—*mycelium*—on turning it over with a stick or spade.

The practical application of this curious fact is that in forming a new forest we want not only the seed of the trees, but some of the forest soil to start the fungus, and the shade and moisture and decaying vegetation of the close forest to enable the fungi to flourish.

The scientific Lucerne planter is careful to bring earth from an old lucerne field to start the root nodules and bacteria that assist nutrition. The gardener grows heaths, rhododendrons, in peaty and other soils and thus secures the fungi and bacteria that naturally accompany them.

For the same reason a few spadefuls of soil from flourishing old forests should, from time to time, be put into young plantations. Also humus and forest soil should be used in forest nurseries, and transplants put out as far as circumstances will allow with balls of earth attached. It is however when the forest has reached the thicket or clean stem stage that the nutritive fungi and bacteria are most likely to become established.

In European forests the Beech which is noted for its soil-improving properties is usually provided with a nutritive fungus at the root (*Mycorrhiza*).

It has been shewn that, under cultivation, a tree is able] to flourish with a root fungus different to its usual species in the forest.

ROOT PARASITISM.

The Sandal wood of commerce and the medicinal Sandal oil are obtained from a small tree growing in Southern India *Santalum album*. All the early attempts to make plantations of this most valuable tree failed. It was then found that Sandal wood required to grow associated with certain other trees and shrubs particularly *Lantana*.

Attempts to grow the West Australian Sandal wood *Santalum cygnorum* in South Africa have similarly failed, where the climate and soil appeared to be well suited to it. I believe that this failure is symbiotic, and that the Australian Sandal like its Indian ally will not grow well alone, but requires some other growth to be associated with it, be that growth bacterial, fungoid or some higher form of plant life.

JARRAH.

From the comparatively poor success obtained up to the present with the cultivation of Jarrah (*Euc. marginata*) in South Africa, I suspect the want of some symbiotic growth, but enquiries made in Australia have, so far, failed to confirm this view. It grows there equally well in pure and in mixed forest, so that it is not the association of some other tree that it requires.

It is of course quite possible that there may be some injurious root-growth attacking Jarrah in South Africa, but repeated examination of the roots, microscopic and otherwise, have failed to give evidence of any injurious root attack. Both in Australia and in South Africa, Jarrah shews the best growth on poor dry stoney ground, where it might escape the root trouble, if it be the cause of its sufferings. Says Mr. C.L. Richardson the Forest Officer in West Australia:—"The finest patches of Jarrah are found upon the most rugged iron stone mountains where hardly any other trees grow."

One thing is certain that Jarrah besides shewing only a mediocre growth in South Africa is liable to fail, (seemingly from some root trouble), at all ages, but particularly during the first two or three years.

SYMBIOSIS AND OTHER TREES.

Cork Oak, Carrob and Chestnut when all has been said and done as regards climate and soil, shew disappointing features in their growth; making one suspect the want of something here which they enjoy in the Northern Hemisphere. This point will shortly be tested as regards the Carrob (*Ceratonia siliqua*) for we have lately imported grafted trees in their own soil.

Kermer and Oliver's *Natural History of Plants* may be referred to for a fuller account of symbiosis.

ZWART ROEST OR ANTHRACNOSE OF THE VINE:

An Effectual Preventive.

COMPILED BY CHAS. P. LOUNSBURY, Government Entomologist

Zwart Roest or Anthracnose of the vine is characterised by a prominent American authority on plant diseases as "perhaps the most formidable disease with which the vineyardist has to contend." Therefore, when the statement that the disease is in the Colony is made, it is but fair to at once add that it has probably been here as long as the oldest vineyardist can remember. The Hon. M. L. Neethling of Stellenbosch clearly remembers the trouble in his district sixty years ago. In the old days little or no attention was bestowed upon it; but in these days of keerer competition and more extensive culture of varieties particularly subject to attack, the vine grower is becoming forced to adopt measures to protect his vines against it.

DESCRIPTION OF THE DISEASE.

The disease is due to a fungus (*Gleosporium ampelophagum*) which attacks the fruit, leaves, and stems, in fact all the growing parts of the vine. It appears to be favoured by moist weather, as it is chiefly a spring disease in the Western Province where winter and spring rains prevail, and a summer and early fall disease in the Eastern Province where the rainfall is principally in the warmer half of the year. Hence in the west, the young shoots suffer most, whilst in the east the spotting and destruction of the fairly large berries is the injury which attracts most attention.

Vines in damp low-lying situations are more subject to attack than those in higher and drier parts, even of the same vineyard. The more vigorous and succulent the growth, the greater appears to be the injury, and perhaps the present importance of the disease in the south-western districts is largely due to the fact that most of the vineyards have been replanted within the last ten years on account of phylloxera. Cases are known where young vines were badly diseased, whilst old vines of the same variety close by were very little affected. It has been suggested that the stock used

has some influence, but more important considerations than the behaviour of the resultant vine towards this disease are likely to determine the choice of a stock. Mr. Lester, of Violet Farm, Constantia, says that Waltham Cross, Muscat Hambro, and Almeria are less attacked on Jaquez stocks than on *Rupestris metallica*, and Mr. Cillie, of Wellington, has noticed that in his vineyard, Hanepoot on Jaquez is less attacked than Hanepoot on Riparia alongside; Jaquez itself, says Mr. Cillie, suffers considerably.



ANTHRACNOSE OR ZWART ROEST. *a*, Section of shoot with foliage and young fruit stalk badly diseased; *b*, Fruit stalk as it should appear; *c*, Half grown berries spotted with the disease.

The appearance of the disease varies with the severity of the attack, and the age of the part affected. Small oval dark spots first appear and sometimes these are numerous enough to give the shoots a speckled look. If the conditions remain favourable for the trouble, the green shoots, the veins and stalks of the leaves, and the fruit stalks soon become spotted with dark, sunken areas as if the parts had been touched with a hot iron. The spots may measure a quarter inch in diameter, and two or more may unite to form an elongated deep wound. The blackness of the spots sug-

gested the common name of the disease, "zwart roest"; and also the name "anthracnose," which means coal disease. When the disease appears early, as it does in the west, the flower stalks may be completely girdled and destroyed, or the flowers all killed, and thus the vines prevented from bearing fruit. If the berries are nearing full size when attacked, large round spots, brown in the middle and reddish at the margin, develop on the surface; and later these spots may scab over or become the starting place for premature decay. The growth of the foliage and shoots is checked and often distorted, and sometimes the parts are quite destroyed. Likewise injury to the stalks of the grape clusters may cause the berries to wither and die.

The disease is now very wide-spread in the Colony and has probably reached all the areas favourable to it. These are chiefly between the sea and the first range of mountains. It appears to be the chief obstacle to the successful cultivation, at Grahamstown, Uitenhage and other eastern parts near the sea-board, of the Hanepoot and some other very popular varieties which are grown in abundance in western districts.

VARIETIES ATTACKED.

Some varieties are particularly subject to anthracnose whilst others are practically immune. at least in the south-western part of the Colony. In 1890 a correspondent in writing to this journal for information on the disease stated that at Swellendam he had found Hanepoot, Muscadel, French Grape, Barbarossa, Waltham Cross, and Blue Acorn very subject to the disease; whilst in his experience Green Grape, Muscat, Hamburgh, and Late Syrian were proof against it. Baron von Babo, then Government Viticulturist, in replying to the letter said that all varieties were more or less attacked, but that he would recommend Small Stein (Riesling), Stein Grape, Hermitage, and Cabernet Sauvignon for trial. Mr. P. Cillie, who is frequently alluded to in these notes, tells me that he has found White Hanepoot, Red Hanepoot, Waltham Cross, Muscat Hambro, Black Hamburg, White French, and Sultana to be much attacked, and Raisin Blanc, Black Prince, Gros Colman, Late Syrian, and Hermitage to be immune, or attacked but little. The recently appointed manager of the Government wine farm at Groot Constantia, Mr. T. A. Watermeyer, lists Raisin Blanc as resistant, and Flaming Tokay, Almeria, Lady Down Seedling, Chasselas, and Crystal in addition to several of the varieties already mentioned as non-resistant. Other varieties which I am told are liable to severe attack are Muscadel and Thompson's Seedless; and others little attacked, Green Grape and Pontac. In Mr. Cillie's experience Raisin Blanc is not attacked at all, but a well known Constantia grower has told me that he has one large block of this variety that gets rather badly attacked. With the view of compil-

ing more definite information on the behaviour of different varieties as regards the disease, the writer would be pleased to learn the observations of interested parties, both east and west. In parts where the disease is very bad, it is inadvisable to attempt to grow the more susceptible varieties.

REMEDY

Anthraxnose is said to have existed in Europe from time immemorial, and many measures for controlling it have been tried. During the past twenty-five years the most popular one has been the winter treatment of the infected vines with a strongly acid solution of Sulphate of Iron. The proportions of the ingredients for this wash most recommended are :

Sulphate of Iron Crystals	...	110 pounds,
Commercial Sulphuric Acid	...	1 quart,
Water	...	22 gallons.

The remedy with this formula, on the advice of Mr. R. Dubois, the late Government Viticultural Expert, was recommended in the "Remedies for Orchard and Vineyard Pests" sheet compiled by the writer and issued by the Western Province Horticultural Board two years ago; and a number of well known wine farmers have since given it a thorough trial. One or more in the Cape, Paarl, Wellington, Piquetberg, Tulbagh, and Worcester Divisions have used it, and all that we have heard from have been well pleased with the results which they obtained. The solution is applied to the dormant sticks and every portion of the surface thoroughly wetted. It is very corrosive and destructive to the skin and clothing, and hence must be handled with care. It is generally applied by means of a swab of rags bound about the end of a stick, but in Europe some use is made of a specially constructed knapsack pump, the metal of which is protected from corrosion by an acid proof coating. Until our growers have had some experience with the remedy, however, it seems advisable that they use swabs or cheap brushes. Mr. C. Pfeiffer of Timour Hall, Plumstead, had had a number of round, fibre brushes made specially for the work of the present winter, and believes that they will prove more economical than rag swabs. If any growers wish to learn how a pump will work, I would suggest that they try with a small bucket pump, like the well-known "Success;" fitted with a fine nozzle. If the apparatus were well washed out soon afterwards, the injury done to it would be of little consequence. Wooden buckets, with wooden hoops if possible, should be used for carrying the solution as it speedily eats holes through metal vessels.

A WELLINGTON GROWER'S EXPERIENCE.

Amongst those who treated a portion of their vineyards last season, and who will make more extensive use of the remedy during the coming winter, was Mr. P. J. Cillie, C. Son, of Vruchtbaar,

Wellington. The writer chanced to visit the farm in the early summer, and was himself impressed by the efficacy of the work. Mr. Cillie's procedure should interest other farmers. He fixed up a pot in which to heat water convenient to the vineyard and by a water course, and provided two wooden tubs in which to do the mixing. The sulphate of iron was weighed out in fifty pound lots at the store room, and the acid measured out in wine bottles, the bottles being filled nearly to the neck. To prepare a quantity of the solution, one of the lots of sulphate was put in a tub, the acid was poured over it, and then ten gallons of boiling water measured in from the pot. The whole was then stirred until the sulphate was all dissolved. While the men were using from one tub, another lot was prepared in the second. The solution was a little stronger in acid than would be obtained by using the formula given above. By the formula about eighteen fluid ounces or two-thirds of a bottle is needed for fifty pounds of sulphate. Mr. Cillie believes in using fully a quarter more, and it may be mentioned that the Hon. C. W. Kohler of Riversdale, Paarl, from tests which he made, concluded that it was desirable to use one and a half times the quantity recommended in the formula. The kind of swab used by Mr. Cillie's boys was made by rolling a strip of hessian or bagging around the end of a stick and binding it in place by wire. The wear soon frayed and softened the end. To protect his clothing, each boy was provided with a long bag in which he cut holes for his head and arms. The application blackened the vine sticks at first but when the sun shone on them for a few hours they turned white. It was then easy to detect any surface that had been missed, and the work was made thorough by swabbing these parts a day or two later. Several thousand vines were treated between July 21st and 29th which was one to two weeks after the vineyard was pruned. The weather at the time was variable, but no rain fell until the day after the work was finished. A few rows were swabbed a second time on August 12th and 13th when the buds were swelling.

The treated vines are nearly all of the Hanepoot variety and are three to five years of age. They had suffered severely the year before from the disease, almost every cluster of grapes having then been destroyed. When seen by me early in December after the treatment, the indications were for a very heavy crop of perfect fruit. It was difficult to find a trace of the trouble amongst the sticks treated twice, and only a few spots on a leaf or young shoot on perhaps every fourth or fifth vine shewed in the portion treated once. The treatment had also effectually suppressed erinose or knob-blaren (*Phytoptus vitis*) which had been prevalent in the vineyard during the preceding year. Ten gallons of the solution sufficed for one treatment of about five hundred vines. Mr. Cillie is of the opinion that a second application is not profitable if the one is done with sufficient thoroughness. As many grafted

vines lean over a good deal, great care is necessary to ensure that the whole surface is wetted, and Mr. Cillie suggests that the soil should be removed to the depth of an inch or two from about the stem to further the efficiency of the work.

The condition of a few White French vines which chanced to be mixed in a block of Hermitage close by shewed by contrast what the swabbing had accomplished on the Hanepoot vines. The boys had sought for and treated a number of White French sticks in the block and these were almost free of the disease and had set perfect clusters, whilst the sticks that had been overlooked were much infected and had lost every berry. Mr. Cillie estimated that his expenditure of about £15 would save him between £200 and £300. He has ordered six tons of sulphate of iron for the use of himself and neighbours during the present winter, and has imported two of the specially constructed pumps from France to test their worth in comparison with swabbing. They have cost 50s. apiece, and since receiving and examining them Mr. Cillie is inclined to believe that their use will prove an economy.

TREATMENT OF TRELLISED VINES.

Part of the Vruchtbaar vineyard is trellised on galvanised wires supported on iron standards. The solution attacked the wire and has caused slight rust wherever it touched, but Mr. Cillie is inclined to disregard this injury and says the treatment would be very profitable even if the wires rusted through in four or five years; he believes they will last eight to ten, and does not think it would be worth while to attempt to protect them. It appears to be necessary to swab any wooden posts as thoroughly as the vine sticks themselves. In the Vruchtbaar flower garden a few vines grow on a high trellis supported by wooden posts. The vines, but not the posts, were treated, and the result was that the disease was almost as bad as if nothing had been done, wherever new shoots grew close to the posts. Ten gallons of the solution sufficed for about two hundred and fifty trellised vines.

ALTERNATIVE TREATMENTS.

As an alternative to the winter use of sulphate of iron, Mr. Dubois has recommended dusting the growing vines with mixed sulphur and lime. The first application, he says, should be made when the shoots are six inches in length, and subsequent treatments be made every ten days. For the first, one part of powdered slaked lime is mixed with four parts of sulphur; for the second, two of lime to one of sulphur; and for the third and later applications, three of lime to two of sulphur. This measure may prove very useful in the parts of the Colony where the disease comes on late, but in the Western Province the winter treatment is probably far superior. The Hon. M. L. Neethling used lime and

sulphur liberally in his vineyards at Stellenbosch this year and though his vines had much less of the disease than in the previous year, the protection obtained was not nearly as complete as was secured by Mr. Cillie.

In America, Bordeaux mixture is the usual preparation applied to prevent anthracnose. Directions for preparing this well known fungicide are given in the "Remedies Sheet," a copy of which can be obtained for the asking from the writer's office. For anthracnose a common American recommendation is to spray the vines very thoroughly before the buds open, again before blossoming, a third time after the berries have set and once or more at ten day intervals later. As the mixture leaves a stain, its use is generally discontinued when the fruit is half grown. The need for applications after the first two depends largely on the nature of the season. The efficacy of Bordeaux mixture to control anthracnose at Grahamstown in the Colony was demonstrated by Mr. C. W. Mally, until recently Eastern Province Entomologist. He succeeded in effectively protecting a few vines where he lived when the fruit on vines of the same variety on neighbouring properties was practically all destroyed. At least in the Western Province, however, the iron sulphate winter treatment by swabbing is likely to be preferred to spraying with Bordeaux Mixture. In Australia, swabbing with dilute sulphuric acid alone is practised, but in this Colony the required strength would be a more expensive preparation than the acid sulphate of iron solution. Sulphate of iron can now be bought for about 10s. 6d. per hundred pounds in Cape Town, and is cheaper by the ton. Sulphuric acid is usually about £2 15s. per case of four 42 lb. jars.

VINE AND FRUIT-GROWERS' CONGRESS.

Wednesday and Thursday, May 23rd, and 24th.

The opening session of the annual Conference of Fruit Growers was held on Wednesday, May 23rd, at the City Hall Buildings, under the presidency of the Hon. C. W. H. Kohler, M.L.C., the following delegates being present: Messrs. W. B. R. Goulden M. Tindale (East London), Jas. Leighton (King William's Town), John Landrey (Stutterheim), J. Landrey and F. W. Landrey (Cathcart), H. Ella (Kongha), H. H. Hards (Graham's Town), D. van Heerden, B. J. Verster and P. W. Michau (Cradock), H. J. Dempers and J. H. Le Roux (Oudtshoorn), P. R. Malleson and L. Cloete (Western Province Agricultural Society), T. Micklem and C. M. Neethling, jun. (Stellenbosch Agricultural Society), O. C. M. Barry and A. C. Buller (Stellenbosch Fruit Growers' Association), C. Heatlie and J. S. du Toit (Worcester Agricultural Society), C. Wilmot and W. H. Lategan (Constantia Fruit Growers' Association), P. J. Cillie and S. W. Joubert (Wellington), and R. J. Bulmer (Paarl). There were also present: The Hon. A. J. Fuller (Secretary for Agriculture), Messrs. Hutcheon (Director of Agriculture), C. P. Lounsbury (Government Entomologist), C. E. Pillans (Horticultural Assistant), F. D. MacDermott (editor of the *Agricultural Journal*), H. Cloete, M.L.A., P. Ryan, F. W. Green, and A. A. Persse (secretary).

The President expressed the pleasure they felt at seeing Mr. Fuller present, and trusted that he had benefited by his visit to England. They knew Mr. Fuller meant well by them, and they trusted he might long be spared to carry on the agricultural work in which he was engaged to the benefit of the country.

MR. FULLER AND SELF-HELP.

After expressing his pleasure at being called upon to inaugurate their Congress, Mr. Fuller said that he considered the earnest faces he saw before him augured well for the success of the future of the fruit trade. Much work was needed before this success was realised, much by the fruit-growers, and much also by the Government. Such associations could enable the Government to do what the farmers desired. It was the deliberations of such associations

which enable the Government to know the requirements of the industry, and a great effort had already been made to push the fruit trade. In looking over the agenda paper, he had been somewhat alarmed. It represented a "big order." He was alarmed because much was expected from the Government and he was alarmed also because he would like to see more of the spirit of self-help—a spirit which was not shewn in the agenda paper. He assured them that the Government realised its obligations, but the farmers must also realise theirs. It was self-help which was needed to put the industry upon a sound footing.

THE HOME MARKET.

In talking of markets, Mr. Fuller, then gave some figures. In 1904, he said, the import fruit-trade had been £34,657, and the export only £8,850. The farmers made the mistake of looking for foreign markets when the best market was at their own doors. He knew that it was not their own fault, but there was a lack of organisation. Good organisation must be realised, and co-operation in order to secure the whole of the home market. On the contrary, the object of the fruit-growers appeared to be to secure the London market. However, he believed the best market was in South Africa. The question was: How to secure it. There was only one means, and that was by uniting, as they are doing by meeting in Congress, and by going one step further, and forming co-operative societies with the object of establishing depots to receive their fruit during the season and distributing to customers.

The season here lasts only two or three months, and they had no means of conserving the fruit and distributing it over a longer period. He believed that means must be found to effect this, and if it were done, it would prove one of the most potent means of capturing the Home trade. Mr. Fuller then wished them to consider carefully the report of the secretary of the Royal Horticultural Society on the show of Cape fruits recently held in London. The report on the whole, was encouraging, describing the show as most interesting and satisfactory and a great credit to the organisers. However, besides encouragement, it contained a word of warning and advice, and he read a few extracts to shew what he meant

The following extracts were read :—

Apples.—"Many very beautiful boxes and examples were shown, very beautiful at a first glance, but on examination, many of the fruit proved soft and the prevalence of the black spot fungus was quite remarkable. Even when it was not sufficiently advanced to shew through the skin, its presence could be clearly detected by the tiny pit-like depressions which so often occur over it. I cannot hold out much hope for a good market for Cape apples

unless, first and foremost, the black spot fungus be got rid of, and then that firmer and crisper varieties be grown."

Pears.—"These were almost, if not quite, as numerous as the apples, and for dessert pears I think there should be a great future at the Cape and a great market in England. The specimens shewn were remarkable for cleanness of skin, tenderness of flesh, and absence of all defects. The size of the individual fruits left nothing to be desired. The report then suggested the twelve most suitable varieties. It suggested also that the variety Chaumontel, new to the Cape, but probably very suitable, should be tried."

Plums.—"The report suggested the crossing of the Japanese plum with some English cooking varieties, the Japanese plum being the fruit-bearing plant: this is to give a little acidity, the South African-grown plums being accused of the lack of flavour."

Peaches.—"A great deal is required before we can call the Cape peaches a success, if indeed, they can ever be so, as quicker transit is needed for such a perishable fruit. At present the fruits are of a very bad colour, woolly and of little flavour."

Grapes.—"Those sent to the show had most of them travelled well and were much appreciated, and would command a fair price in the market, but they would make double money if the berries had been thinned so as to let the light and air round them. It ought to pay any one to grow Muscat of Alexandria, and Madresfield Court under glass, so as to catch the London season when all Home-grown grapes are over, and the new ones not yet in."

Melons.—"Melons are chiefly objected to on account of their magnitude. The English market wants small melons."

Dried Fruits.—"I cannot think dried apricots are ever going to make a market. They seem to lose all flavour in the double process of drying and then stewing again. Peaches are also adversely criticised, but the dried plums were excellent. Tough skins, but that is a necessity if they are to dry well and retain their flavour, as these distinctly had. In my opinion, they were quite equal to the best Californian plums."

Sultanas were also praised: "they were cleaner than the ordinary Sultanas, and had it not been for the strings attached to almost every sultana, they would have been preferred to the sultanas from the Eastern Mediterranean. I cannot say any good word for currants. They were flavourless and full of pips."

Bottled Fruit.—"Bottled apricots were very fine. I doubt whether it can be possible for the Cape, with its dear labour, to compete in such things with Spain and Portugal with their labour at half the cost."

After reading these extracts, Mr. Fuller concluded by hoping that the deliberations of the Congress would be to the advantage of the country in general and the individual farmers in particular. Certain fruits grown in this country bore comparison with the best grown in any part of the world, and he hoped that the deliberations

of the Congress would tend to remove certain defects noticeable in the exhibits at the late London show, and that at the next show they would have better results.

The President's Address.

The Hon. C. W. H. Kohler, M.L.C., as President of the Western Province Board of Horticulture, then delivered the President's address in which he gave a review of the more important work that had been done by the Horticultural Board since it became a recognised institution, in the course of which he said: It is now 12 years since you first met as a Congress representing different districts, in order to discuss matters, and pass resolutions upon such subjects as you wished to bring to the notice of the Government. I have very little doubt, when the general body of viticulturists and fruit growers have passed in review before them, what your executive the Board of Horticulture has recommended, initiated, and carried out, they will readily admit that the formation of a Board was a step in the right direction, and that it has succeeded in doing a great deal towards helping along their great industry. Fruit and vine growing in the Cape Colony is a great industry. When we come to consider that in the Province represented by your Board 87,000 persons are practically wholly dependent upon it, whilst 350,000 are partially so, we must claim that it is one of the most important of our industries, and should be possessed of some special organisation by means of which it can bring its wants to the notice of the Government and Parliament of the country. We are, however, given to understand that there is some strong movement on foot to deprive you of the means you have hitherto possessed of reaching in as direct a manner as possible the Department that was really formed for the benefit of the farmer, and which is kept going at considerable cost to the country, in order that the administrative blunders of past years should be minimised, by reason of as direct a knowledge as possible of the wants of those engaged in agriculture. Yet you are asked to throw yourselves into the arms of what we may very well call a very estimable body of gentlemen, who have for a number of years been qualifying to represent your direct interests by running the agricultural shows of the country, partly, I admit, out of a feeling of kindly sympathy for the farmer, but certainly in a number of cases with a view to number one, and an eye to increased trade to the local storekeeper, for which business acumen all success to them say we; may their trade prosper and increase. Still, that does not give them special aptitude to manage and control the farming interests of the Colony. Although

THE AGRICULTURAL UNION.

may be a very excellent institution in its way, when we see for example, Port Elizabeth represented by Messrs. Loubser, Guthrie,

Daverin, and D. M. Brown—all gentlemen of great mercantile experience, and for whose knowledge, when it comes to a question of hardware or soft goods, we have the profoundest respect—surely we are hardly to be blamed when we feel that in matters concerning our daily business we prefer to be in touch with the Agricultural Department ourselves. To shew how closely we have been of late, it is only necessary to pass in review the work accomplished during the past decade. When your Board first took office in 1895, there was considerable dissatisfaction as to the way in which the department was issuing American vine cuttings. The Board recommended Vine Distribution Boards for each district consisting of two local farmers and the Civil Commissioner; the recommendation was carried out, and no further complaints were heard. These Boards have now, however, outlived their usefulness, and as there is practically nothing for them to do I think the time has arrived when this Congress should advise the Government to abolish them. Sufficient interest was not being taken in the reconstruction of the vineyards and the grafting of American vines, many farmers refusing to believe that their vineyards could be safely and permanently re-established by this means. The Board recommended, and assisted to establish co-operative nurseries, and induced the Government to give grants in aid. Upon the recommendation of the Board, and under its direct supervision, a certain sum of money was distributed in prizes for several years for the best orchards, vineyards, and nurseries of grafted vines. About the same time as that

DREADFUL SCOURGE,

the phylloxera, was destroying the vineyards, the orange trees of the Colony commenced to suffer to a considerable extent from red scale, and the unfortunate farmer, who had seen his vines dying by the thousand, now saw the last few pounds of income, which he had derived from his orange trees, being filched from him by this dreadful little insect pest. The Government by now were seeing the usefulness of the Board, and placed a small sum of money (£250) at its disposal. With this amount and the aid of that excellent practical expert (the entomologist) the Board purchased a Gassing plant, and gave a number of demonstrations in different parts of the Colony, and soon proved to the farmers that it was possible, by the aid of tents and chemicals, to successfully combat red scale; further, the Board gave grants to what were called Gassing Clubs—I do not mean debating societies, but associations of farmers who were prepared to co-operate in the matter of procuring and working an outfit for their mutual benefit. With this aid a number of clubs were started in both the Eastern and Western Province. Some of the

USEFUL MEASURES

recommended by the Board, and carried out by the Government were: The inspection of imported fruit, prohibition of importation of seedling stocks, with a view to preventing the importation of some dreaded pests, the utilisation of the boys at the Porter Reformatory for grafting vines, improvement of *The Agricultural Journal*, and increased duty on imported spirits in order to level up to the difference brought about by the introduction of the Cape Colony Excise. The Board issued a spraying calendar, which has had a wide circulation and has proved most useful to all fruit-growers. Took in hand the organisation of the annual wine show. Drew up a list of fruit trees that had proved to be unsuitable for certain districts of the Western Province. Imported netting for protection of trees from the fruit-fly and birds. Purchased and distributed certain farming publications to the different associations. Held an inquiry into the suitability of certain stocks for the grafting of citrus fruits. Appointed a committee to inquire into the question of experimental stations suitable for the requirements of the Western Province. Also an inquiry into the alleged failure of vines grafted on certain American stocks, and a committee to inquire into the wine and brandy industry. At the invitation of the Government, in conjunction with the Western Province Agricultural Society this Board appointed a joint committee to inquire into the improvement of the methods of disposing of agricultural produce. In all three inquiries very valuable information was elicited, and in many instances the recommendations of these committees were carried out by the Government.

IMPORTANT RESOLUTIONS.

In order that some of the important resolutions adopted and not yet carried out may not altogether be relegated to the dim vista of the forgotten past, and for your guidance at this Congress, I bring to your notice a few that might with advantage once more be pushed forward. A union, on the co-operative principle, of fruit-growers for the purpose of purchasing all material. I notice Stellenbosch has started to work in this direction; might we not with advantage make this the keystone of a great edifice? Government was asked to appoint an agent in London for the purchase of manures at low rates. We also asked Government to publish in the *Agricultural Journal* prices for feeding stuffs and artificial manures in the leading markets of South Africa, London, and New York. Recommended a bonus on all wines exported overseas. Recommended cheap wine licences. Recommended an Adulteration Act. Recommended that a bonus be given to young wine farmers who are prepared to go to foreign countries to study wine-farming, provided that they undertake upon their return to

lecture to and instruct their fellow wine-farmers. In as few words as possible I have endeavoured to sketch the more important doings of the past. It would have been quite impossible in the limited time at my disposal to have gone into minor matters and so perhaps you may consider this resumé not as complete as it should be, it should, however, serve to furnish a fair indication of

THE BOARD'S UTILITY.

Not the least matter for congratulation is the fact that during the last session the Nurseries Inspection Bill, which you have not grown weary of bringing forward year after year, at last became law and one source of the dissemination and spread of insect pests has been done away with. Since you last met, co-operation has been more in the air than ever, and it is a matter for congratulation that the people have so eagerly agreed to bind themselves together in the endeavour to improve the product of the country. Many of you in this room have joined one or other of these co-operative organisations, and whilst we are all prepared to heartily congratulate the Secretary for Agriculture and the Director of Co-operation on the success attained in the formation of these societies, still, I trust we may be allowed to say that we hope that this will not be looked upon as the be-all and end-all of the movement as far as they are concerned. It is not the number of the societies that the country is eagerly watching to-day, but rather their successful working; upon that everything depends. Failure will throw us back a generation, whilst if those already formed are properly supervised, and wisely managed, and so become a commercial success, hundreds will follow where they are now to be counted by tens.

EXPORT OF FRUIT.

Although it is gratifying to note that the tonnage of fruit exported this season (1,013 tons) is more than double that of last (462 tons), we are bound to admit the export of fruit is not making the headway that many of us expected it would have done by now. and it might be of some little benefit to the industry if we candidly and openly discussed the reasons for this. I well remember the late Mr. Rhodes telling me that the Rhodes Fruit Farms were not going to engage in local trade, but would ship all their fruit to England, so when one notices the returns for the past season and notes that the whole of the Rhodes Fruit Farms together only shipped as much as a single grower (Mr. H. O. Arton), it leads us to think Mr. Rhodes's policy has been departed from, and we naturally inquire why? Has the shipment of fruit to Europe proved a failure, and, if so, why? You will no doubt all agree that the carriage and transport of fruit oversea, although a failure in the early years of the fruit export trade, can now with

truth be called a success. We have proved beyond a doubt that South African fruit can be landed in Europe in the best of conditions; it is admitted our local markets are only too often glutted to such an extent as to cause the grower heavy loss on his consignments, so that one may conclude that there is a large amount of fruit awaiting a market. Undoubtedly a great number of fruit trees have been planted of late years, many of which are now coming into fair bearing, and each year the crop of pears will be very much larger.

THE FAULT

then is not a want of enterprise at this end, in the growing of the fruit or in the methods of packing and shipment, but rather points to the conclusion that the export has not proved remunerative. The reports from England from private sources speak most highly of the quality and condition of our fruit, whilst unfortunately most of those who have shipped in bulk complain of heavy losses. One does hear of consignments of peaches being sold at 1s. per peach, but then again one hears of large consignments of fruit being sold at 3s. per case, and even less. It does seem strange that the paltry amount of fruit now shipped from here should be said to flood the English market at times. We are also told that rings of buyers are formed. If either of these statements are facts, then surely the solution of the difficulty lies partly in one of the recommendations I have previously mentioned as having been made by the Board of Horticulture to the Government, and that is the appointment of an agent on the other side to supervise the sale, etc., of Colonial fruit and other produce. It would also appear to be necessary to have cold storage, so that fruit could be stored upon arrival, and only sold as required, and not put upon the open market to be merely sold by auction to the highest bidder. It is well-known what occurs upon our own market, where a number of dealers will depute one man to buy for the lot. Only too often he buys at his own price—as a consequence there is no legitimate competition. Such a state of affairs on the other side can only be combatted by the means I have suggested; at any rate we might with advantage discuss the question as to how the situation should be met.

WINE AND BRANDY.

Whilst there is this slight cloud upon the horizon of the fruit industry, it is gratifying to be able to say that whereas last season the prospects of the vine-grower were none too rosy, a poor harvest and low prices having brought many into debt, this year, thanks to the continuance of the advances to agricultural distillers upon their brandy and a near prospect of a market in the Transvaal Colony for the same, as well as the heavier sales of grapes in the large towns, prices have advanced considerably, and

although the crop of wine and brandy has not come up to the expectation formed at the beginning of the season, still on the whole it is slightly better than last year. One still occasionally hears croakers questioning the wisdom of the Government in making advances to agricultural distillers, and so it might be just as well to review the position: In 1904 Parliament voted a sum of £100,000; in 1905 Parliament voted a sum of £50,000, and of this sum of £150,000 during the two years 1904 and 1905 there has been advanced to distillers £86,349, on fustage £11,380, expenses raising loan, etc., £5,905; in all, £103,634. Add to this cost of collection, £21,766 (which includes the collection of the Excise on both the items not being obtainable separately); total expenditure, £125,400. Revenue collected on Colonial spirits, only £456,402; net profit to the Colony, £331,002. Of the amount advanced there is still available a cash amount of £46,363. The Government holds 785,437 gallons of brandy, the selling price of which is to-day about 2s. 8d. per gallon, say, £104,724. Fustage, less depreciation, £10,252; total, £114,976; against an advance of £97,729; which leaves a balance to the good of £17,202. I am prepared to admit this is not much of a margin, nor a transaction that would be considered sound by any banking institution, but taking into account all the circumstances, the position is

FAIRLY SATISFACTORY.

We must not forget that, owing to the depression, less brandy than usual has been consumed during the past two years, to say nothing of the new districts that have been closed by the Licensing Courts for the sale of liquor to natives during the same period, and thus the surplus in the hands of the Government is larger than it would otherwise be. But if that surplus were sent out of South Africa, and dumped for what it would fetch, or the Government had the bungs drawn from the vats, they had made advances on, and allowed the contents to run into the sea, they will still have made for the country a considerable item of revenue, no less a sum than £331,000, which is quite as much as is contributed by the diamond industry. Whilst this considerable item of revenue has accrued to the State, the struggling wine farmer has benefited, for whereas, before the imposition of the Excise, brandy stood at £13 per leaguer, it is now saleable at £17, and wine has advanced proportionately. Gentlemen, we have an exceedingly interesting agenda before you, and are no doubt anxious to get to work. I will, therefore, not detain you any longer, except to say how cordially we welcome our friends and fellow-farmers, the members of the Eastern Province Associations. This is the third occasion upon which they have shewn their good fellowship, and hearty co-operation by attending the Western Congress. Such action must tend to the general good of our

industry, and serve to still further add to that smooth and harmonious working together of the Eastern and Western Boards, which has so distinguished the past relationship. I cannot omit to say that we are greatly indebted to the Government for the consideration which our representations have always met with at their hands, and for the evident desire they have shewn to push forward the agricultural industries of the Cape Colony. May prosperity to your industry, great good to your country, and consequently happiness to you all, result from your deliberations at this Congress. (Applause.)

On the motion of Mr. W. H. Lategan, a small committee was appointed to bring up a report, shewing how far the recommendations made at last year's Congress had been carried out, the committee consisting of Mr. J. Landrey, jun., and the mover.

THE COLONIAL BOTANIST.

Mr. Leighton, on behalf of the King William's Town Association, moved: That the appointment of a Colonial Botanist is a matter of urgent necessity.

The motion was negatived, it being considered that a botanist would be useless to fruit-growers.

FUNGOID DISEASES.

Mr. Malleson, on behalf of the Western Province Agricultural Society, said it was of the utmost importance to the fruit-growing industry that action be taken to secure the services of a mycologist to study the fungoid diseases, now rapidly increasing in Cape Colony; and that, in making the appointment, preference be given to a scientist capable of investigating all diseases of plant life. The mover said he did not mean to cast the smallest reflection on Mr. Lounsbury, who had done his very best to help the farmers in dealing with insect pests, but he could not deal with everything. Instead of running to Government for everything, he suggested that the fruit-growers should subscribe money for the purpose of investigating the various fungoid diseases.

Mr. Leighton moved that the Congress re-affirm what it said last year on the subject.

The President said that the Board of Horticulture had made representations on the subject to Government, and, while the Government was very sympathetic, it pointed out the difficulties the country laboured under at present in the way of finance. He thought it wise, however, to press the matter.

Mr. Bulmer supported Mr. Malleson's motion, but he saw difficulties in the way from a financial point of view.

Mr. Hutcheon (Director of Agriculture) suggested whether it would not be better that they should have a combined research

laboratory for the whole of South Africa. (Applause.) It would be able to deal with this and other matters. The subject under debate had already been taken up, but nothing very definite had been decided, thus shewing that we required men of unusual ability to solve the question. It was practically impossible at the present time for any single Colony to have qualified experts in every branch.

Mr. Heatlie supported Mr. Hutcheon's suggestion. He proposed that the Government be asked to try and arrange with the other Governments of South Africa for the establishment of a laboratory to examine fungoid and other diseases in plant life.

A motion in terms of Mr. Hutcheon's suggestion was carried.

IMPORTED FRUIT.

Mr. Malleson drew attention to the large quantities of Canadian and Australian fruit being sold in Colonial markets. At the present time it hardly paid to cold store Cape fruit, on account of the large quantities imported from other countries.

Mr. Bulmer said they were trying to establish a market in America for Cape fruit, and yet at the same time they were trying to prevent American fruit coming into the Colony. They should limit the ports of entry so as to ensure getting only clean fruit in the Colony. People in the Colony did not yet look upon fruit as a necessary article of diet. The fruit-growers would not be doing themselves any good by putting a duty on imported fruit.

Mr. Micklem was opposed to placing a duty on apples. For one thing such a duty would damage the shops which sold Cape fruit in the summer, but which in the winter had to depend for a livelihood upon the sale of imported fruit. Thus a duty on imported fruit would damage the Colonial fruit, as it was very probable that the imposition of a duty on imported fruit would lead to the closing up of the fruit shops, and thus damage the sale of Colonial fruit.

Mr. Meyers said the fruit-growers were looking to the American market as much as to the European market, and in the face of that it would be a very serious thing to have an import duty on fruit.

Mr. Lategan said that by means of cool chambers the Cape growers should be able to supply the local market with fruit all the season through. He did not think the Cape would ever be able to establish a market in America. He moved that Government be asked to place a duty on imported fruit.

Mr. Bulmer, as an amendment, moved that the time was not ripe for a duty on imported fruit.

Mr. J. Landrey, jun., moved, and Mr. Cillie seconded, that the Congress affirm the resolution passed at the Oudtshoorn Congress

in favour of a duty on fresh fruit, preference to be given to Canada and other British colonies.

Mr. Bulmer thereupon proposed that the Oudtshoorn resolution be rescinded.

Mr. Lategan withdrew his motion.

The President said the Oudtshoorn resolution had already been sent to the Government.

Mr. Bulmer moved that Congress was not in favour of an import duty on fresh fruit.

This was lost, and the Oudtshoorn resolution was re-affirmed.

PORTS OF ENTRY.

Mr. Bulmer moved that the number of ports of entry for imported fruit be limited to three.

Mr. Lounsbury explained that there were at present only four ports of entry into the Colony, and he did not think Mossel Bay should be closed.

Mr. Gribble inquired would it not be necessary to make Kimberley a port of entry for fruit entering the Colony from the north?

Mr. Lounsbury said the matter of fruit was receiving attention and it would not be wise to discuss the matter.

The matter then dropped.

PEACH FLY.

Mr. Ella asked whether it had been brought to the notice of the fruit experts that the peach fly remains in the ground for one season or more in the form of an egg.

Mr. Lounsbury replied that there had been a recrudescence of the peach fly in many of the districts of the Colony.

THE CODLIN MOTH.

Mr. Goulden, referred to the spread of the codlin moth, and moved, seconded by Mr. Leighton, that representations be made to the Government as to the necessity for proclaiming the Aliwal North district as a clean area, while placing the town itself in quarantine.

Mr. Lounsbury did not know how the Eastern Province people could imagine that they could quarantine a town to prevent fruit being sent from that town to the surrounding districts; it was utterly impossible, for they could not have a policeman at every road. They had arranged with the railways to refuse to send consignments to clean areas in the Eastern Province and they had notified the Magistrates to be on the look out. In the case of Aliwal North they had investigated the matter referred to by Mr. Leighton. They came to a very different conclusion to that arrived at by

Mr. Leighton, namely that it was not introduced that year, but in all probability at least two years before. It was extremely doubtful that the codlin moth came from the Western Province. The Midlands had been longer infected than the West. The Department had to have its regulations practicable and districts had to be made units of administration, and Aliwal North was no exception. It was exempted from the protected areas when the pest was discovered. They certainly could not prevent people, in ignorance or otherwise, taking fruit from the town to their farms, but it was a thing that was unlikely to occur. The codlin moth was far more largely distributed over the Colony than fruit growers realised. It was at Riversdale, Darling, Beaufort West and other centres all over the Colony. He was not sure that King William's Town was exempt—it was at Queenstown, but there was very little of it there.

The motion was then withdrawn.

Mr. Barry proposed that the quarantine be removed altogether from the Eastern Province.

Mr. Goulden moved that Mr. Lounsbury be supported in his endeavours to keep the codlin moth out of the Eastern Province. The mover remarked that he fully realised the difficulties that the Agricultural Department had to contend with in the matter.

Mr. Goulden's motion was agreed to.

Mr. Lounsbury said the codlin moth was not in the Midlands nor was it at Cathcart, East London or Komgha, but what was there was the fruit fly which attacked all the apples in many of the orchards and also attacked many of the pears. It was something terrible this year.

The Congress then adjourned for lunch.

LUNCHEON AT THE YORK ROOM.

At the invitation of the Western Province Agricultural Society, the delegates were entertained at luncheon at the York Room of the Theatre Restaurant. Mr. P. Ryan, in the absence of Mr. Barry, the President of the society, occupied the chair, and among those present were the Secretary for Agriculture and the Mayor of Cape Town. Full justice having been done to a capital meal, a brief toast list was gone through.

Mr. Ryan, in proposing the health of the visitors—to which was coupled the names of Mr. Fuller and the Mayor—emphasised the point that the permanent interests of South Africa depended upon its agricultural resources.

The Secretary for Agriculture, in his reply, said he did not think the country had sufficiently recognised the merits of the departmental officials, who had fostered the Colony's agricultural interests. He had been accused of being one who represented a capitalistic Ministry. That might be so, but he had not very much capital just now. (Laughter.) He agreed with the chairman that

when mining areas were worked out, the people would depend on agriculture, and he thought that the country would claim that a certain portion of the earnings of the mine must be ear-marked for the benefit of agriculture. (Applause.)

The Mayor also replied, welcoming the delegates to Cape Town.

Mr. Kohler said they must congratulate Mr. Fuller on the improvement that had been brought about in the Agricultural Department since his advent to office. He referred to Mr. Hutcheon's services on behalf of Agriculture and the interest Mr. Ryan had taken in the same matter. (Applause.) As far as the Agricultural Societies were concerned they had done most excellent work, and although they were not prepared to amalgamate with the Agricultural Union they felt that Agricultural Societies had done a great deal of good to the country. (Applause.) In conclusion he proposed the health of Mr. Ryan and thanked him for the way in which the Western Province Agricultural Society had entertained the delegates.

The toast was drunk with musical honours.

Mr. Ryan, in reply, regretted the inability of Mr. Barry to occupy the chair.

Mr. Kohler, in proposing the health of the delegates from the Eastern Province, said they in the West appreciated sincerely the fact that they had amongst them so many men from the East who had sacrificed their time to attend the Conference. (Applause.) The Western growers heartily congratulated the Eastern growers on the progress they had made in fruit growing and hoped that their industry would continue to grow.

Messrs. Goulden and Leighton replied.

The health of Dr. Hutcheon having been drunk with musical honours the proceedings closed with "God Save the King."

AFTERNOON SESSION.

PRIZE MONEY AT SHOWS.

The Hon. H. J. Dampers, M.L.C., moved: That the Government be respectfully requested to reconsider its decision in granting only 3-10ths of the prize money awarded at agricultural shows, and that the usual 5-8ths contribution be given.

The President proposed that Government be requested to make the usual 5-8ths contribution, provided that in the case of new shows application be made before the Estimates were framed.

The latter motion was carried.

Mr. Bulmer, on behalf of the Paarl Farmers' Association, moved: That the whole of the prize-money and expenses connected with the annual wine-shows held by the Board of Horticulture be defrayed by Government.

Mr. Cillie said he would second the motion, if the mover would make it applicable to dried fruit and raisin shows.

Mr. Landrey, Jun., was opposed to Government being asked to do so much for the wine-shows, and urged the necessity of farmers cultivating the principle of self-help instead of running to the Government for everything.

Mr. Gribble said that with regard to the bolstering up or supporting of the wine industry the same thing was being done with regard to the sheep industry. For instance, sheep dip was carried free, and £60,000 a year was spent in eradicating scab. The wine show was open to the whole Colony. The last wine show cost them £287 and he maintained that the State should incur the whole of the expense.

Mr. Murray pointed out that agricultural shows were more largely attended than wine shows, the latter appealing only to a small class.

Mr. Hards remarked that if wine shows were attended only by experts and exporters it was unfair to ask Government to give the whole of the prize money. In the Eastern Province they fought their own battles and did not worry the Government so much as they did in the Western Province, where he thought they asked Government to do too much for them.

Mr. Micklem said nine-tenths of the producers of the Western Province were wine-growers, and as the Government was supporting all sorts of things he thought it was a very small matter to ask Government to help the wine shows.

The President remarked that unless Government gave some help, the wine show would fall to the ground and a great blow would be dealt to the wine industry.

Mr. Landrey, senr., pointed out that the wine growing industry was an old one. Surely there are wealthy wine-growers who could put their hands in their pockets for the purpose of these shows.

Mr. J. du Toit said that, seeing the large sum that was paid by the brandy producer in Excise the sum of £300 asked for from the Government was a paltry one.

The motion was supported further by Mr. Bulmer and Mr. Barry, the latter observing that the Association was one of fruit and wine producers.

Mr. Heatlie said that owing to phylloxera the vineyards had to be reconstituted at great expense and it was necessary that viticulturists should receive all encouragement. It was not too much to ask for the whole grant.

The President suggested that the motion should apply to only one wine show and the vote should not exceed £300. With regard to stock shows there was, not one, but dozens of shows, while there was only one wine show and it was open to the whole of the country.

Mr. Malleeson, as a Colonist, considered the wine industry was

a very important one and they should help any industry that was going to bring money into the Colony, and the wine industry was undoubtedly one of these. They should look at the question not as Western or Eastern Province men, or as sheep or wine farmers, but as Colonists.

Messrs. Goulden and Ella supported the motion, the latter remarking that the Eastern Province should support the Western Province in this matter.

The motion as altered by the President was carried, only three delegates voting in the minority.

FREE POSTAGE.

Mr. Bulmer moved that all communications from Farmers' Associations sent to any Government Department, to members, or to kindred associations; also monthly circulars to members and agricultural literature distributed by the associations in their districts shall pass through the post free, and be marked "on service," and franked by the secretary.

Mr. MacDermott drew attention to the fact that letters addressed to Government Departments were carried free if endorsed "O.H.M.S."

Mr. Landrey saw many difficulties in the way of carrying out the proposal, and moved the omission of all the words from "to members" down to "districts."

Mr. Leighton seconded.

Mr. Le Roux said they already had so many facilities for sending letters at a cheap rate that it was beneath their dignity to ask for such a concession. (Applause.)

Mr. Gribble said that he had sent nearly two hundred letters to Government officials and never once was he told that stamps were unnecessary. In supporting the motion he mentioned that in the United States agricultural bulletins to the number of five millions were sent post free. It must be remembered that the Societies were not working for their own individual interests but for those of their districts and the Colony at large.

Mr. Murray said that if the proposal were carried into force the Societies could send out a thousand circulars where now they sent out only a hundred.

Mr. Ella hoped that advertisements would be excluded from the scope of the motion.

The motion was carried.

INVESTIGATIONS AND COMPETITIONS.

Mr. Bulmer, on behalf of the Paarl Association, moved: That grants on the £ for £ principle be given for investigations undertaken by the associations and towards the expenses of competitions held under their auspices, provided that such

investigations and competitions receive the approval of Government. The mover mentioned that in the Paarl district they had a 50 guinea trophy for the best kept orchard in the district and the expense of holding that competition fell on the Paarl Association. The competition did a lot of good and Government would help materially by making a grant towards the expense.

Mr. Heatlie seconded.

Mr. Hards proposed as an amendment that the words "and towards the expenses of competitions" be omitted.

Mr. Malleson supported the amendment, as did also Mr. Heatlie and Mr. Landrey, sen.

Mr. Micklem observed that many of the investigations held by the associations had been of great benefit to the country as a whole.

Mr. Bulmer accepted the amendment and the motion as amended was adopted.

BOOKS AND PERIODICALS.

Mr. Bulmer, on behalf of the Paarl Association, moved: That grants on the £ for £ principle be given by Government to associations towards the purchase of books on agricultural subjects for their lending libraries, and for agricultural periodicals, etc., distributed gratis in their districts.

Mr. Gribble stated that some of the books on agricultural subjects were very expensive, and many farmers were not in a position to buy them.

Mr. Dempers seconded the motion, which was opposed by Mr. Hards.

The President remarked that seeing that Government was contributing on the £ for £ principle to satisfy the desires of the novel-reading public, they might very well ask the Government to help farmers in the way suggested by the motion.

Mr. Goulden proposed that the grant do not exceed £5 for each association.

The motion was carried, with the proviso that the books be approved by the association's committee.

SECRETARIES' SALARIES.

Mr. Bulmer, on behalf of the Paarl Association, moved: "That the attention of the Government be called to the increasingly good work being done by Farmers' Associations, and the difficulty of giving their secretaries adequate salaries, owing to the fact that by increasing their subscriptions they would be liable to decrease their membership, their object being to induce as many farmers as possible to work together for the common good; and that assistance by Government towards the payment of secretaries' salaries would enable such associations to largely increase their usefulness and good work."

Mr. Landrey, jun., opposed the motion. He was amazed to find that out of the seven resolutions submitted by the Paarl Association, five of them were of a begging nature—(applause)—so that instead of being a gathering of independent farmers they were a begging community. (Applause.)

Mr. Havers remarked that the more they could pay their secretaries the more good work could be done.

The President said the only way they could run a society was by having a good secretary, and the great difficulty was to get a good secretary unless payment was made him. The work of the association was increasing to such an extent that it was only fair that the secretaries should receive payment for their services.

Mr. Wilmot endorsed the view expressed by the president. Farmers contributed largely to the revenue of the country, and they were asking for a little in return.

Mr. Malleon observed that some of the farmers seemed to think that Government existed simply for the purpose of paying out money.

Mr. Heatlie thought there should be some safeguard regarding the associations which were to be helped in this manner.

Mr. Cillie said the Paarl Association was doing good to the country, and its investigations regarding vines was an eye-opener to the whole Colony.

The President said the resolution did not ask the Government for anything. (Laughter.)

Mr. Meyers took exception to the view expressed by Mr. Landrey that secretaryships should be regarded as training grounds for young men. The success of an Association depended upon the ability of the secretary.

The motion was defeated, eleven delegates voting against it.

The Congress then adjourned until the following morning.

SECOND DAY.

The annual Conference of Fruit-Growers was continued on Thursday, May 24th, at the City Hall Buildings, under the presidency of the Hon. C. W. H. Kohler, M.L.C., the following delegates being present: Messrs. W. B. R. Goulden and M. Tindale (East London) Jas. Leighton (King William's Town), John Landrey (Stutterheim), J. Landrey and F. W. Landrey (Cathcart), H. Ella (Komgha), H. H. Hards (Grahamstown), D. van Heerden, B. J. Verster and P. W. Michau (Cradock), H. J. Dempers, M.L.C., and J. H. le Roux (Oudtshoorn), P. R. Malleon and L. Cloete (Western Province Agricultural Society), T. Micklem (Stellenbosch Agricultural Society), O. C. M. Barry and A. C. Buller (Stellenbosch Fruit Growers' Association), C. Heatlie and J. S. du Toit (Worcester

Agricultural Society), C. Wilmot and W. H. Lategan (Constantia Fruit Growers' Association); P. J. Cillic and S. W. Joubert (Wellington), and R. Bulmer (Paarl). There were also present: The Hon. A. J. Fuller (Secretary for Agriculture), Messrs. Hutcheon (Director of Agriculture), C. P. Lounsbury (Government Entomologist), F. D. MacDermott (Editor of the *Agricultural Journal*), H. Cloete, M.L.A., P. Ryan, J. P. Hannon (Co-operative Expert), Peter Davidson, Truter, and A. A. Persse (Secretary).

PRESENTATION TO MR. LOUNSBURY.

The President said he had a very pleasing duty to perform before the business of the day was proceeded with. They all agreed that the work of Mr. Lounsbury, the Government Entomologist, had been of the greatest utility to the farmers of the country, and they all felt grateful to him. Besides being a scientific and a capable man, they had found Mr. Lounsbury a sympathetic man as well. He did not place himself on a pedestal above them, but tried to help them on the right course, never hesitating to say when they were wrong. They trusted that he would long be spared to live among them, and that the good feeling existing between the grower and Mr. Lounsbury might long be maintained. On behalf of the Congress the President then presented Mr. Lounsbury with a set of "Chambers's Encyclopædia" and a fitted travelling case.

Mr. Lounsbury, in acknowledging the presentation, observed that one of the speakers at the luncheon on the previous day stated that the officers of the Agricultural Department were not appreciated as they should be. In one respect, he quite agreed with that opinion, but in another he did not. As regarded the department as a whole, it was true that a great deal of work was done which the farmers, as a whole, did not appreciate, because they did not know the officials and the difficulties under which they laboured. As an individual, however, he had no fault to find on this head.

HORTICULTURAL AND AGRICULTURAL SOCIETIES.

Mr. Leighton moved: "That the Government be asked to assist horticultural societies on the same basis as agricultural societies."

Mr. Hards said it seemed to him the Government were doing a lot for them already and he was of opinion that the motion was going too far.

The motion was negatived.

ADULTERATION OF SEEDS AND FERTILISERS.

The Hon. H. J. Dampers, M.L.C., on behalf of the Oudtshoorn Fruit Growers' Association, moved: "That Government be requested to bring a Bill before next session of Parliament to prevent the adulteration of seeds and fertilisers." The mover said during the

last session of Parliament he moved in this direction in the Legislative Council, when the Colonial Secretary informed him that a Bill with that object would have been introduced, but for the pressure of public business. Up to the present, however, nothing had been done in the matter, although three years ago a Bill was drafted with the assistance of Mr. Ryan and Dr. Nobbs.

Mr. Ryan observed that there was a chance of the Bill being again postponed this session, because of the pressure of public work. Ten years ago the matter was first brought up and last year a bill was prepared and ready to be introduced, but on account of pressure of work it was not brought in.

Mr. Hards strongly urged that Government should give them the protection they desired.

Mr. Le Roux mentioned that he bought a quantity of lucerne seed, which he subsequently found was mixed with a large quantity of dodder.

The motion was agreed to, together with a rider by Mr. Bulmer, that each association be requested to ask its Parliamentary representative to help in the passage of the Bill.

PRAISE FOR MR. PILLANS.

Mr. Goulden on behalf of the East London Association, moved: "That it is imperative that a fruit expert be established in the Eastern Province; his place of abode, or headquarters, to be approved of by the Eastern Province Horticultural Board."

Mr. Verster seconded.

Mr. Hards paid a tribute to the excellent work done in the Eastern Province by Mr. Eustace Pillans; but for Mr. Pillans they would have nothing like the number of fruit trees in the Eastern Province that they had to-day. Apple growing in his district had been entered into on a very large scale and in the course of two or three years they would be in a position to supply the whole of the Eastern Province and perhaps have a bit over to spare for Cape Town as well. (Hear! hear!) They were quite entitled to have somebody located in the Eastern Province who would advise them what to do.

Mr. Barry said that the gentleman who supported the motion was yesterday very indignant at the Western Province delegates asking for assistance from Government for the wine grower.

Mr. Heatlie said if the fruit growers of the Eastern Province found it necessary to have someone to assist them then the motion should be supported. (Applause.)

Mr. Meyers suggested that Mr. Pillans should be transferred to the Eastern Province.

Mr. Bulmer made a similar suggestion remarking that in the Western Province they did not now stand in so much need of the services of a fruit expert as they formerly did.

Mr. Murray said they appreciated the work done by Mr. Pillans in the Western Province, and they thought that, thanks to Mr. Pillans and their own efforts, they had arrived at the stage when they could spare Mr. Pillans's services.

The motion was carried.

THE IRRIGATION BILL.

Mr. Tindale withdrew the motion to discuss the Irrigation Bill, notice of which had been given by the East London Association.

LOCUST EXTERMINATION.

Mr. Tindale, on behalf of the East London Association, moved: "That Government be assisted in every way in their efforts towards exterminating locusts." The mover mentioned that for the past six years he had had his crops eaten off by locusts.

Mr. Goulden, who seconded the motion, said that for seven years in succession he had had locusts, losing crop after crop, and if the scourge kept on he would be absolutely ruined.

Mr. Bulmer suggested that the different Associations in the locust areas should take combined action.

Mr. Lounsbury said there was a chance to do a great deal in this matter and he had hoped that Government would have endeavoured to do more than try to obtain the co-operation of other Colonies. The subject was to be discussed by the Inter-Colonial Agricultural Union during the ensuing week and he was sure that all the South African Governments would be urged to do their best against this terrible pest. People in the West knew nothing about the ravages of locusts and he was very glad they didn't. The Government did not see its way to undertake operations which in Natal were proving so successful, and he feared that another season would go by without our doing so much as the Transvaal had done. The Government was offering arsenite of soda to those farmers who would take it, but many would not use it because they feared it would injure their stock and veld; this fear was groundless. Government was also trying to trace the movements of the swarms, the police inquiring at the farms once a month and reporting to the Agricultural Department. This information would guide the department as to where it should concentrate its efforts. A proposal would be made at the Agricultural Union Conference to centralise these statistics and for reports to be sent out periodically shewing where the locusts were and what damage had been done. What they really wanted in this Colony was a large sum of money with which to popularise locust destruction and try, at any rate, to save the crops.

The motion was adopted.

Mr. Goulden, who remarked that the only two things that locusts did not eat were tobacco and chicory, proposed a vote of thanks to Mr. Mally, Mr. Lounsbury's assistant.

The motion was agreed to.

NATIVE LABOUR.

Mr. Goulden, on behalf of the East London Association, moved: "That the difficulty of obtaining reliable labourers would be minimised to some degree by inducing all labourers desiring employment to register themselves at certain centres." The mover said it was very difficult to obtain native labour, and very frequently it was of a poor quality. Farmers would be willing to pay a small sum towards labour bureaux.

The motion was lost by a majority of one—the voting being seven to six.

DR. HUTCHEON'S SERVICES.

Mr. Dempers, on behalf of the Oudtshoorn Association, moved: "That this Congress desires to impress on the Government the desirability of confirming the appointment of Dr. Hutcheon, C.V.S., as Director of Agriculture, he being a gentleman, who, during the 26 years of his public service, has gained the respect and confidence of the farming population throughout the Colony, and is eminently fitted by the vast experience he has accumulated for the important position." The mover paid a high tribute to Dr. Hutcheon, remarking that during his 26 years' residence in the Colony he had gained the confidence of every member of the farming industry. (Applause.)

Mr. Lategan seconded the motion.

Mr. Landrey, jun., said the feeling with which Mr. Hutcheon was regarded in the Eastern Province could be condensed into three words for they always spoke of him as "Dear old Hutcheon." (Applause.)

Mr. Le Roux was glad to hear the last remark adding that Mr. Hutcheon was always willing to assist the farmers.

The motion was unanimously adopted amid loud applause.

EXPERIMENTAL STATION.

Mr. Leighton, on behalf of the King William's Town Association, moved: "That the Government be approached with a view to establishing an experimental station in the Eastern Province."

Mr. Heatlie seconded.

Mr. Ella did not favour experimental plots.

Mr. Havers said that in his district, if they wanted any advice or information, they went to the Rhodes Fruit Farms, where it was readily given them.

Mr. Tindale: I am very sorry we did not have Mr. Rhodes in the Eastern Province. (Applause.)

The motion was carried.

AMERICAN STOCKS.

Mr. Lategan, on behalf of the Constantia Association, moved: "That for the guidance of viticulturists, this Congress is of opinion that a standing Commission should be appointed to watch and report on the behaviour of the different American stocks now being used as graft bearers in the Colony." The mover said that with regard to the grafted vines they found that they had not the right sorts, and in the Paarl district they were uprooting the *metallica* vines and replacing them with *aramon* stock.

Mr. Goulden seconded.

Mr. Cloete said that the Horticultural Board Commission on the subject of vines, of which he was a member, sent in only a preliminary report, as there were no more funds with which to continue the investigations.

Mr. Heatlie supported the motion.

Mr. Micklem suggested that the work could be done better by three or four local committees working in conjunction with the Fruit Growers' Associations.

Mr. Hards did not see the necessity of the motion.

The motion was carried.

VICTORIA DAY.

Mr. J. Landrey, jun., moved the following motion, of which his father had given notice on the previous day: "To move the adjournment at noon on Thursday to enable the delegates to proceed in a body to pay respect to the statue of our much-venerated King, being unable to do this to himself in person, and further by this act to convey our everlasting recollection of our dearly-beloved late Queen Victoria, who did so much to extend the Empire of which we are so justly proud."

The motion was adopted, and the members of the Congress on the conclusion of the morning sitting adjourned to the foot of the King's Statue, opposite the City Hall.

The Hon. C. W. H. Kohler, M.L.C., said that day was held in reverence by every British subject—not only throughout Canada and Australia, but he now believed in all parts of South Africa. (Applause.) They could well understand the feelings which had prompted their Eastern Province friends in suggesting that that small demonstration should be made in front of the statue. They felt that in her whose memory they honoured that day they had had, perhaps, one of the greatest Queens who had ever lived. She was not only a good queen and a good mother, but an example to every woman in the Empire. (Applause.)

Mr. J. Landrey, senr., expressed gratification at the manner in which his idea had been carried out, by the gentlemen of the Western Province and he trusted that what had happened in the past would be forgotten.

The Hon. Mr. Dompers, M.L.C., speaking in Dutch, agreed with every word uttered by Mr. Kohler. All he could say on behalf of the Afrikanders was "Long Live the King."

Three cheers were then given for His Majesty. "God Save the King" being also sung.

AFTERNOON SITTING.

ANALYSIS OF SOILS.

Mr. G. Wilmot moved: "That for the guidance of fruit and vine growers, this Congress respectfully recommends to the Director of Agriculture the advisability of taking steps to have an analysis made of the soils in various vine and fruit-growing areas."

Mr. Malleson did not think it fair to ask Government to do the work for nothing. He proposed as an amendment that Government be asked to make the analysis at a cheaper rate.

Mr. Hutcheon was of opinion that some sort of systematic soil analysis was necessary.

Mr. Landrey, junr., suggested that the word "producer" be substituted for the words "fruit and vine growers."

Mr. Le Roux was of opinion that a grain farmer would benefit by having analyses of his soil. The farmer had to study the nature of the different soils and farm accordingly.

Dr. Hutcheon thought it was very necessary for the analyst himself to select the soils to be analysed.

The President said that what they really required was not alone the bare analysis of the soil, because that did not convey anything to the lay mind, but what they wanted was to be informed what the soil lacked and what was the best kind of manure to be used for it. (Applause.)

Mr. MacDermott pointed out that while analysis of soils is necessary and exceedingly useful, it was a mistake to think that by a general analysis of the soil of a vast country like the Cape Colony, the farmers could be told that the nature of the soil was so and so, and therefore, they must get a certain manure to make up its deficiencies. In addition to manure, the farmers had to consider the questions of drainage, the lie of the land and the nature of the crops to be raised. Mr. Juritz, the senior Government Analyst had carried out soil analyses in certain districts and had published a pamphlet on the subject. From this he (Mr. MacDermott) gathered that the great deficiency in most of the coast soils was lime.

The President mentioned that in the Drakenstein Valley the growing of potatoes was once largely carried on, but now no one grew potatoes there at a profit. The secret appeared to be that now there was something lacking in the soil; and when farmers found out what it was that was wanting, the growing of potatoes would again become practicable in the Drakenstein.

Mr. MacDermott pointed out that in such a case the fault was obvious. The potato growers had grown the same crop on the same land continuously and made no effort to replace the plant food taken out of the soil.

Mr. Ella maintained that the Department's charges for soil analyses were too high altogether. The analysis should be made at cost price.

The motion was adopted.

AMALGAMATION OF SOCIETIES.

The question of the amalgamation of Agricultural Societies and Farmers' Associations was submitted by the Western Province Board of Horticulture.

Mr. Heatlie said the matter did not concern the Congress and moved that it be expunged from the agenda.

Mr. Leighton intimated that the Eastern Province members did not wish to take part in the discussion of this matter.

Mr. Bulmer stated that he was instructed by his association to vote solidly against amalgamation.

The President said that the Agricultural Department wrote to each association pointing out the desirability of some amalgamation between the different associations. They knew that there had been some movement on the part of the Agricultural Union to absorb the Farmers' Associations, and other societies such as those represented there that day. The Government made a qualifying remark in its letter to the effect that on account of the Fruit Growers' Associations having lately come into being, perhaps it would be as well if they were not absorbed. Personally he did not see why the question should be shelved. They felt if they were to be absorbed at all it should not be by a body like the Agricultural Union for that would be like the tail wagging the dog. If there must be amalgamation it must be an amalgamation entirely of Farmers' Associations.

Mr. Hutcheon said that as he had had something to do with the issuing of the circular in question it would be well for him to make an explanation. The Agricultural Department had no idea that the Fruit Growers' Congress or any other body should be absorbed, but that there should be some central body which would voice the desires of the different farming interests throughout the Colony. The idea of the Government was that by means of amalgamation there should be combined action not only for the

Cape Colony, but for all the South African Colonies so that there should be something like united voice in the matter, instead of having several different bodies which might discuss exactly the same matters but arrive at entirely different conclusions.

Mr. Malleson said the executive of the Farmers' Association and the Agricultural Union felt that they were both doing the same work, and in certain cases were acting against one another when they really wanted to act together. Accordingly a meeting was held at Port Elizabeth to see if some means could not be formed of working together and it was decided to hold another meeting in Cape Town next week. The Fruit Growers' Congress should work in harmony with these two bodies, and he was very sorry to see the President in his opening address attacking not only the Agricultural Union but some individual members of that body, while at the luncheon on the previous day the President again attacked the Union.

Mr. Bulmer thought that the last speaker had not grasped the point. He (Mr. Bulmer) feared that the horticultural interests would be so small that they would not have the voice in the deliberations in the Union that they ought to have.

Mr. Micklem said that the reason that Congress was being held was because the fruit growers had been unable to work with the Agricultural Society. The object of the Agricultural Society in his district was to have a show once a year, and after that the interests of the fruit-growers might go to the dogs. (Hear! hear!) The Agricultural Shows were excellent things, and excellent things for the farmers, but the object of the Fruit-Growers' Association was to get from each other the best information they could, so as to make their operations pay. Amalgamation would mean that the interests of the fruit-growers would be swamped.

Mr. Hutcheon thought there was a good deal of misconception on the matter. Amalgamation did not mean that they should give up their own organization, and that they would be swamped, but really that they would extend their usefulness by becoming members of the larger association, which should work with associations in other Colonies.

The President said that if they amalgamated they would probably be going back to the same position as the Agricultural Society, and simply send two delegates to the Agricultural Union Congress. The fruit-growers would thus have a very small voice in the deliberations of the Union. Unless the fruit-growers were going to be admitted on an equal footing and be given one-third of the voting power they should not agree to amalgamation. Even then he was not certain that they would be in such a favourable position as they were to-day.

The Hon. A. J. Fuller said the community of interests would be very well served by an amalgamation, but at the same time they would not lose their identity. The Agricultural Union was going

to be a big representative body, and discuss the larger and broader questions, and the Horticultural Board should be represented on it. Government could not get effective guidance unless all the farming interests were combined.

The President said that if there had been any honest desire on the part of the Union, the Fruit-growers' Association would have been represented at the interview between the Union and the Farmers' Association. He was not hostile to the Agricultural Union.

Mr. Hards asserted that the majority of the agricultural societies were controlled by mercantile men. (Hear! hear!)

Mr. Hutcheon observed that the Inter-Colonial Agricultural Union desired that one union should represent each Colony and it would be very awkward if it were otherwise.

Mr. Goulden said East London was opposed to amalgamation.

Mr. Landrey, Junr., thought that any suggestion from the Agricultural Department should as far as possible be fallen in with.

Mr. Heatlie moved that the matter should be expunged from the agenda on the ground that it was outside their province.

The motion was carried.

THE OSTRICH FLY.

Mr. Dempers, on behalf of the Oudtshoorn Association, moved that Government be requested to take steps to eradicate the ostrich fly.

The motion was ruled out of order.

IMPORTED LUCERNE.

Mr. Dempers moved, on behalf of the Oudtshoorn Association, that Government be requested to increase the duty on lucerne, so as to protect the Colonial product.

Mr. Le Roux complained of the high rates charged for the conveyance of lucerne by railway.

Mr. Fuller did not think there was any necessity for the motion, the Colonial farmer having ample protection so far as lucerne was concerned. The only point they might consider was that the military got their produce free of import duty but against that they had to pay higher railway rates for imported as against the Colonial product.

Mr. Heatlie moved, as an amendment, that the matter be deferred to the next Congress, but the amendment was negatived, and the motion was carried by the casting vote of the president.

ADULTERATION OF WINES.

Mr. Micklem moved: That Government be asked to press forward the Bills against the adulteration of wines and brandies, fertilisers, jams, and chemicals used for agricultural purposes.

Mr. Fuller stated that Government had determined to bring forward both Bills this session.

The motion was agreed to.

SALE OF LIGHT WINES.

Mr. Cillie, on behalf of the Wellington Fruit Growers' Association, moved : That Government be asked to grant better facilities for the sale and protection of light Colonial wines.

The President believed that it was not the intention of the Government to touch liquor legislation this session.

On the motion of Mr. Goulden, the following resolution, adopted at the Oudtshoorn Congress, was reaffirmed : In the opinion of this Congress, it is most desirable that in the interest of the wine industry, upon which such a very large section of our community is dependent, cheap licences be granted for the sale of natural Colonial grown wines only, and that the Adulteration Act should be strictly enforced by Government on Colonial grown wines and brandy.

SUGAR IN WINE.

Mr. Heatlie, on behalf of the Worcester Agricultural Society, moved : "That the addition of sugar or other sweetening matter in the manufacture of wine should be declared and made illegal."

The President expressed the opinion that the matter should be dealt with in the Adulteration Act.

Mr. Cloete said it was hard for a farmer to see the whole of his stock of wine made useless because he was not allowed to add $\frac{1}{2}$ per cent. of sugar.

Mr. Micklem defended the use of a small quantity of sugar, which would make no difference to the consumer.

Mr. Lategan maintained that there was no necessity whatever to add cane sugar to wine. For one thing the addition of sugar—and water—would add to the production of wine.

Mr. Wilmot said one object to be aimed at was to prevent the wine merchants adding sugar.

Mr. Landrey, jun., pointed out that the division of opinion on the subject on the part of the Western Province growers made it difficult for their Eastern Province friends to arrive at a decision on the motion.

The President urged that the law should allow the addition of sugar under certain conditions—for instance, when a farmer had a certain quantity of grapes which did not ripen within a stipulated time. It was done in other countries, and it would have to be done in this country. He had it from an influential wine merchant that nearly two-thirds of the wine which was bought in the Colony was unsound.

Mr. Heatlie said they differed among themselves to a certain extent, but he had not come across a single wine farmer who was

not anxious that the use of sugar should be made illegal. Mr. Meyer, the late Viticultural Expert, was very strong on the point that it was not necessary to use sugar.

Mr. Cloete said the climatic conditions of Constantia during the last four or five years were different to what they were twenty years ago. He was not anxious to increase the quantity of the wine but its quality, and a lot of wine would be saved by the addition of two per cent of sugar.

The motion was negatived by five votes to four.

THE GOVERNMENT THANKED.

On the motion of Mr. Hards a vote of thanks was passed to Government for what it had done for the industry. The mover remarked that the present Government had done more for fruit growers than any other Government. To the motion was appended a vote of thanks to the Agricultural Department for the attendance of its officials at the Congress.

CAPE FRUIT IN LONDON.

Mr. J. P. Hannon, the Co-operative Expert, speaking regarding his recent visit to England, said he found that while Cape fruit was becoming more popular at Home, the condition of the market itself was entirely unsatisfactory, inasmuch as the exporter got only a small price for his fruit; yet it was retailed at a high price in London. Pending Mr. Chiappini's return, however, he would not make any suggestions as to remedying this evil. The recent exhibition of Cape fruit in London had been attended with considerable success. He saw two steamer consignments in London, and in only one or two cases was the fruit absolutely rotten.

The President thanked Mr. Hannon for his advice.

Mr. Hannon, in reply to a question by the president, said there was no such thing as flooding the British market with Cape fruit. What was wanted was an agent in London who should look after the interests of the exporters.

Mr. Persse detailed the steps which had been taken by the Fruit Exporters' Association to advance the interests of the exporters.

Mr. Hannon stated that there was no uniformity either of size, colour, or quality in many of the cases of Cape fruit he had seen opened at Covent Garden.

THE NEXT CONGRESS.

On behalf of the Eastern fruit growers, Mr. Leighton extended a cordial invitation to the Congress to hold its next session in the Eastern Province.

The invitation was accepted.

A vote of thanks was given to Mr. Kohler for presiding over the Congress, and to the Corporation for the loan of a meeting-place.

The Congress then closed.

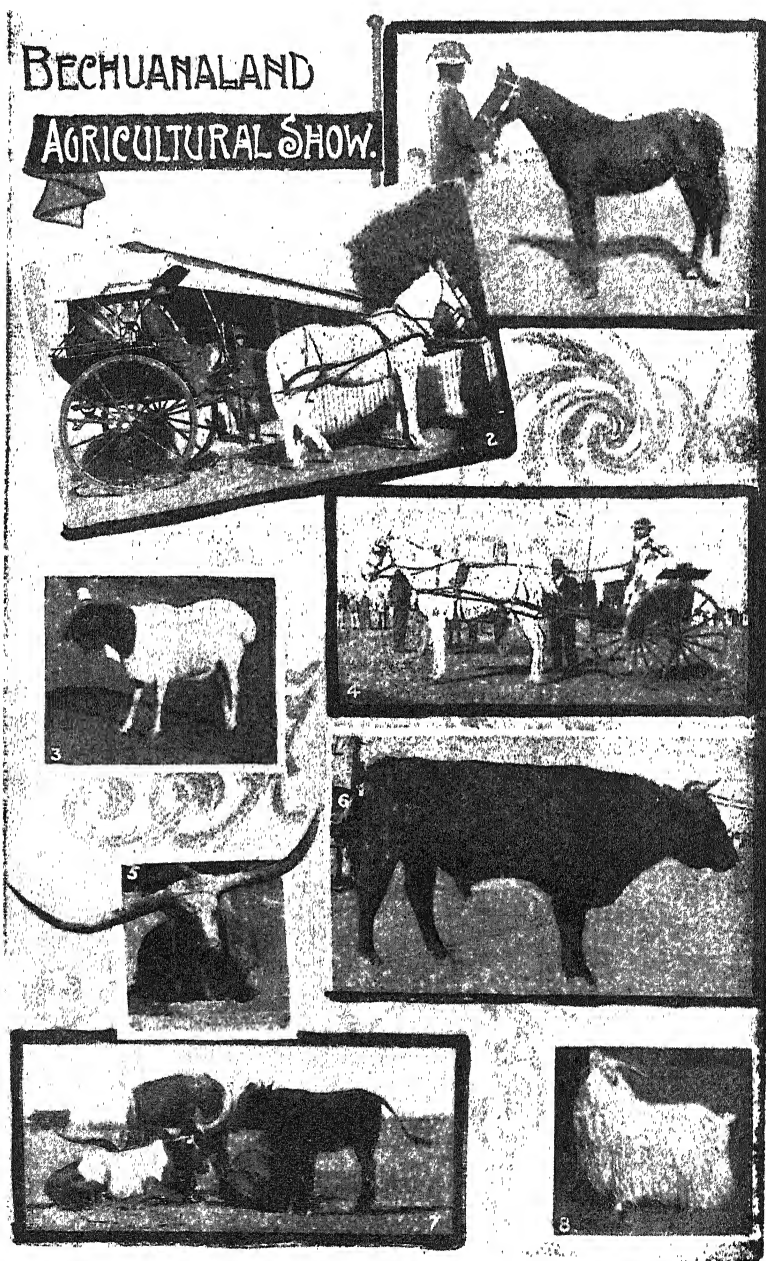
BECHUANALAND AGRICULTURAL SHOW.

The Annual Show held at Mafeking this year on the 18th of April was fairly well patronised. A correspondent, who also supplies the accompanying photos, by H. S. Kaye, forwards the following particulars, which we regret could not be published earlier, owing to pressure on our space:—

HORSES.—The classes were fairly well filled, though, owing to its being the end of the season, the De Beers Company did not exhibit their horses, which required a rest, having only just completed a round of most of the Colonial shows. In the class for pure-bred stallion, Mr. Colin White, of Pokwani, secured first place, from Mr. Sharp's "Edward III.," by "Florismart-Miss Lucy," and two others. South African-bred Riding Ponies, under 14·2 hands, were a good class, first prize going to Mr. L. Cooke's "Metal," with Mr. N. C. de Kock's "Basuto" second. The classes for yearlings and two-year-olds, bred in the district, produced some very promising entries.

CATTLE.—There were eight entries for best Shorthorn Bull, and as some were very young and others pretty matured, the judge recommended that in future these should be divided into classes according to age. The strongest class in the show was that for two South African-bred Heifers, Mr. Van der Heever coming first with a couple of Short-horns, and Mr. Colin White second, with Frieslands. The judge, Mr. Trollip, of Witmoos, remarked that he was surprised not to see a better show of oxen, and from what he had seen and knew of Bechuanaland, he was convinced that it was simply want of interest on the part of the farmers in the district, which was the cause of the classes for slaughter oxen and trek oxen not being, as they should, the leading features of the Show.

SHEEP AND GOATS.—Merinos were poorly represented. Mr. A. A. Hockly, who judged, remarking that "no growth of wool was mentioned, but should not think they were adapted for this part of the country. *Persians.*—Here I was convinced that these are the sheep for the district. Condition very good. Might be improved by using the best pure bred stock rams, and I have no doubt they would be a pleasure to farm with, and more profitable than woolled merinos or goats. I would suggest separate classes for lambs and two-tooth, and not have all compete for the same prize. This is a



(1) 1st prize Yearling Filly (Bech. Protectorate Govt.); (2) 1st prize Cape Cart and Pair; (3) 1st prize Persian Ram, Colin A. White, Phokwani; (4) 1st prize Single Harness Horse, Musson Bros.; (5 and 7) "Zambesi Shorthorns" exhibited by Wirsing Bros., Horns measure 7ft. 10½in. from tip to tip; (6) 1st prize Shorthorn Bull, Musson Bros; (8) 1st prize 2-tooth Angora Ram Bessington & Gardiner.

strong class. *Africanders*.—My remarks on Persians would hold good here. *Goats, Angoras*.—There were two entries of very choice animals, evidently stall-fed, the rest were low in condition, and not up to show form."

The Judges, Messrs. Giddy and Smith, said that there was a gratifying improvement over last Show in the Poultry section. Special mention should be made of a magnificent pair of American Mammoth Bronze Turkeys and a pair of Buff Orpingtons, shewn by Mr. A. Buller, of Stellenbosch, and a Black Minorca Cock and Hen, bred by Mr. H. Davidge Pitts, of Rondebosch, which are only 6½ months old, and should add many more to Mr. Davidge Pitts's collection of trophies.

The Section for Agricultural Implements, etc., was most disappointing, only one collection of Implements and one Windmill Pump being entered (by Messrs. A. W. and A. E. Fincham). Probably the cost of railway transport on a big lot of heavy implements operated unfavourably; but one would think that the manufacturers and their agents would be more ready to take advantage of the means of bringing their wares before the notice of the crowd of visitors, not only from Bechuanaland and the Protectorate, but also the adjacent districts of the Transvaal. Mr. Roberts, of Adelaide, was awarded a first prize for his well-known Tubular Gates. Mr. J. Gerrans shewed some splendid specimens of Cape carts, but unfortunately had no competition to face.

KING WILLIAM'S TOWN

HORTICULTURAL SOCIETY.

(Contributed).

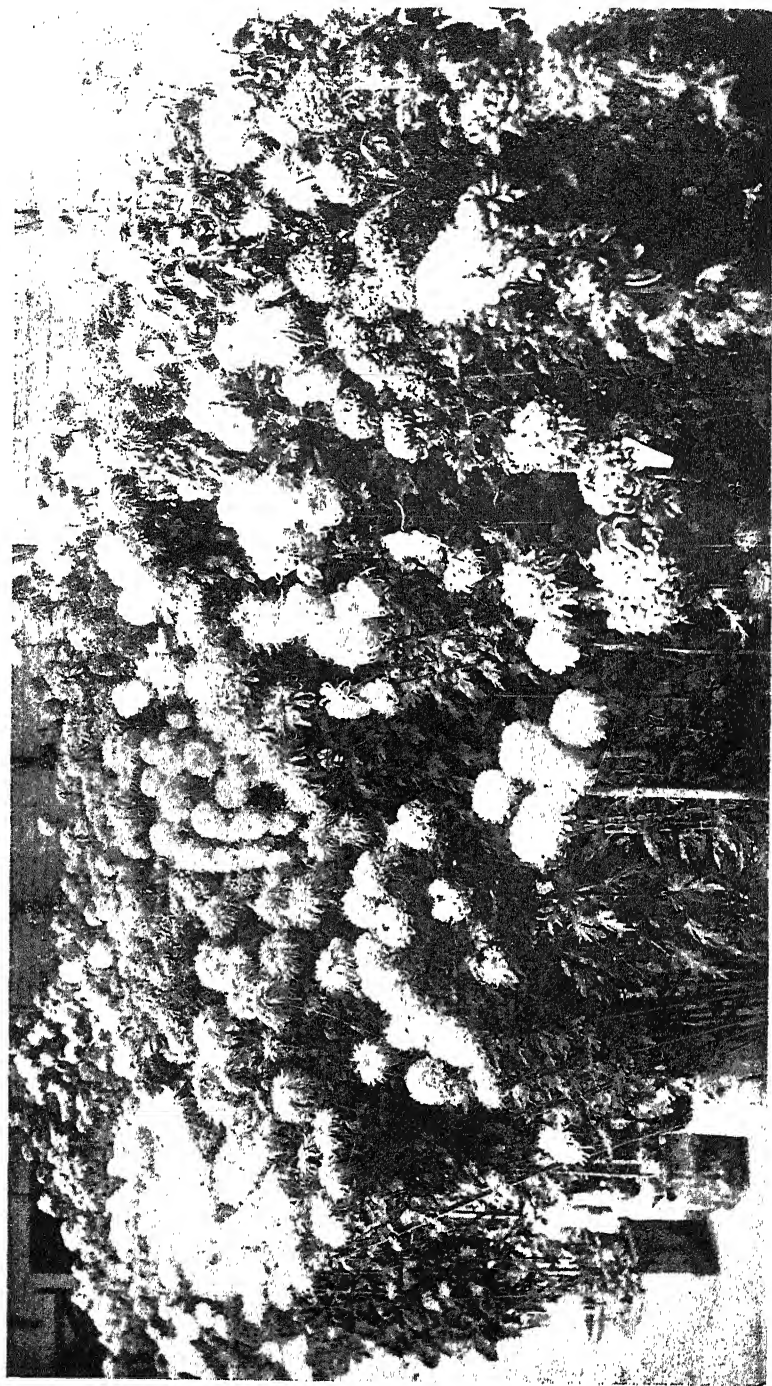
The first Autumn Show of Chrysanthemums and other plants, also fruit and vegetables, was held on the 10th of April, in the Victoria Drill Hall, Queen's Road, King William's Town, and was undoubtedly the best of its kind ever held here.

The chrysanthemums were the leading feature, and both the plants in tins and the cut blooms were greatly admired by the visitors who thronged the hall during the afternoon and evening. In the cut bloom classes Messrs. J. W. Weir and E. S. Reid were the principal prize winners, both gentlemen staging blooms of very high merit; in the classes for plants in tins, Messrs. G. J. Randall, C. Rowe, R. J. Thomas and W. E. Royce, were the winners in the order named, and all the plants shewed evidence of good and careful culture. The photograph sent herewith of this portion of the Show gives a good idea of the numbers and size of the blooms, but utterly fails to convey any idea of the beautiful colours contained in the various groups.

Of plants other than chrysanthemums, Dr. J. I. Brownlee showed good specimens of South African and also of foreign ferns, Mrs. Sanson and Mrs. R. J. Thomas being the other successful exhibitors in this section.

The table decorations formed a very pleasing feature, occupying the whole of one side of the hall; fruit and vegetables were only fair; and, taken on the whole, were disappointing for such a district as King William's Town.

A pleasing feature of the Show was made of cut flowers and plants contributed by the nurserymen of King William's Town, not for competition; Mr. Jas. Leighton had a most comprehensive collection of cactus dahlias, containing a large proportion of new and beautiful kinds, backed by Araucaria Excelsa and other fine foliage plants, altogether a most interesting exhibit. Messrs. J. Hobson & Co. contributed a very fine display of cut roses and bouvardias, well set up, and reflecting great credit on the exhibitors. From the Botanic Gardens came pots of Eucharis Amazonica in bloom, Cocos Wedelliana and maiden hair ferns. In the evening a musical programme was rendered by Mr. Kilman's band, and tea and other light refreshments were supplied by the ladies of the Benevolent Society for the benefit of the funds of the Society. Altogether, the Show was a great success.



Group of Chrysanthemums at King William's Town Show, April 18, 1906.

THE AGRICULTURAL UNION OF CAPE COLONY.

Ninth Annual Congress.

FIRST DAY, MONDAY, MAY 28TH, 1906.

The Ninth Annual Congress of the Agricultural Union of Cape Colony, assembled in the Minor City Hall, Cape Town, on Monday, May 28th, under the chairmanship of Mr. C. G. Lee, Acting President.

The following were the delegates elected by the respective Societies named to attend the meetings of the Congress :—

Van Zyl, J. J. W., Britstown Agricultural Society.
Bayly, F. C., Britstown Agricultural Society.
Louw, J. P., Stellenbosch Agricultural Society.
Van der Byl, W., Stellenbosch Agricultural Society.
Van Aardt, J. G., Aliwal North Agricultural Society.
Kidwell, A. J., J.P., Aliwal North Agricultural Society.
Douglass, A. W., Koonap Farmers' Association.
Van Breda, H. H., Bredasdorp Agricultural Society.
Albertyn, J. D., Bredasdorp Agricultural Society.
Viljoen, Dr. A. G., M.L.A., Caledon Agricultural Society.
Le Sueur, J. S., Caledon Agricultural Society.
Willmot, C. H., Cape Flats Farmers' Association.
Creed, H., Cape Flats Farmers' Association.
Duckitt, C. J., Darling Agricultural Society.
Vollmer, Th., Darling Agricultural Society.
Richards, R., Sundays River Farmers and Fruit-growers' Association.
Matare, J., Oudtshoorn Farmers and Fruit-growers' Association.
Le Roux, J. H. J., Oudtshoorn Farmers and Fruit-growers' Association.
Smith, —, Good Hope Farmers' Association.
Carey, —, Good Hope Farmers' Association.
Michau, P. W., M.L.C., Cradock Agricultural Society.
Du Plessis, M. J., Cradock Agricultural Society.
Van Heerden, H. C., Cradock Agricultural Society.

Burger, A. P., Worcester Agricultural Society.
 Lategan, A. B., Worcester Agricultural Society.
 Richmond: Members of Parliament.
 Barry, A., Western Province Agricultural Society.
 Myburgh, P. A., Western Province Agricultural Society.
 Starke, R. Western Province Agricultural Society.
 Melck, M., Western Province Agricultural Society.
 Lee, C. G., Stud Book Association.
 Bruwer, E., Robertson Agricultural Society.
 De Wet, D., Robertson Agricultural Society.
 Rubidge, W., M.L.A., Graaff-Reinet Agricultural Society.
 Maasdoorp, G. H., M.L.A., Graaff-Reinet Agricultural Society.
 Frost, Sir John, M.L.A., Queenstown Agricultural Society.
 Ginsberg, F., M.L.A., King William's Town Agricultural Society.
 Warren, Col., M.L.A., King William's Town Agricultural Society.
 Guthrie, A. W., J.P., Port Elizabeth Agricultural Society.
 Daverin, J., Port Elizabeth Agricultural Society.
 Hurndall, R. F. M.L.C., Port Elizabeth Agricultural Society.
 Brown, D. M., J.P., Port Elizabeth Agricultural Society.
 Wood, H. R., M.L.A., Albany Agricultural Society.
 Slater, J., M.L.A., Albany Agricultural Society.
 Brabant, General, M.L.A., East London Agricultural Society.
 Hillier, J. C., M.L.A., East London Agricultural Society.
 Cumming, Colonel, East London Agricultural Society.
 Schonnberg, N. E., Malmesbury Agricultural Society.
 De Kock, J. W., M.L.A., Bechuanaland Agricultural Society.

There were also present the following gentlemen: As representing the Natal Agricultural Union, the Rev. Jas. Scott, President; as representing the Transvaal Agricultural Union, Messrs. A. H. Malan, and F. G. Nicholson, and Mr. G. D. Alexander, President of the Inter-Colonial Union.

The minutes of the last Annual Congress, as appearing in the Report for 1905, were taken as printed.

The Hon. Secretary, Mr. D. M. Brown, J.P., submitted the following

ANNUAL REPORT.

In presenting the annual report, your executive cannot but congratulate the country upon the steady growth in agricultural and pastoral pursuits. The general feeling is that the stock of the country is rapidly increasing, and that so far as the meat supply is concerned we are able, without any assistance from the imported article, to supply the demands of the Colony; while wool, mohair, and ostrich feathers—the staple products of this country—have reached prices giving general satisfaction to the farming community, thereby tending to increase the wealth of those engaged in these industries, and to add to the prosperity of the country generally.

The exports of fruit have somewhat increased of late, but there is yet much to be done in this direction, and it is earnestly to be hoped that greater strides will be made in the near future, as your executive feel that this industry is worthy of closer attention on the part of the farmer, and will be ultimately a great benefit to the Colony.

The South African Stud Book, which was initiated by the Western Province Agricultural Society and developed by this Union, has made great progress during the past year, and a permanent office in connection therewith has now been established. It is anticipated that, at an early date, a first issue of this useful and necessary work will be in the hands of stock breeders and others interested. The ultimate result of this will be that duly registered stock may be obtained by purchasers, and the benefit to the various classes of breeders cannot be too highly estimated. Your executive would urge those interested to give all the assistance they can towards bringing the stock of the Colony to greater perfection, and the Stud Book is acknowledged to be one of the best means to this end.

In the month of October last, the Inter-Colonial Conference was held in Natal, and your Union was duly represented there. The minutes of proceedings of the meetings are now laid upon the table for the information of members.

In terms of last year's resolution, a meeting was arranged and duly held at Port Elizabeth, during the time of the show, between the executive of the Central Farmers' Association and your executive, and after deliberation it was agreed that a further meeting should be held with a view to unity of action.

It is to be noted with pleasure that the Government has appointed that old and tried friend of the farmers, Dr. Hutcheon, Chief Veterinary Surgeon, as Director of Agriculture. His practical knowledge of the requirements of farmers; his continual travelling amongst them for a long period of years in conjunction with his regular attendance at agricultural conferences in the sister States, have all tended to broaden his mind and widen his experience; and your executive feels that it is voicing the opinion of the agriculturists of this country in saying that the appointment is one that will meet with general approval, and increase the confidence of the many interested in this department. In this connection we would be failing in our duty as representatives of the farming community if we omitted to place upon record our appreciation of the very able services rendered to the farmers by the officials and others connected with the Agricultural Department. Their continuous efforts towards the tracing of diseases, the investigations and research undertaken with a view to benefit the farmers, and the general attention given to all matters considered to be of interest or value to the Colony, deserve and receive general commendation.

Your executive desires to convey to the Government its thanks for the *Agricultural Journal*, which, in its improved form and continued wealth of illustration, is bringing home to the farmers, by pen and picture, much that is of value in connection with prize animals, and the special illustrations dealing with diseases are most instructive and serviceable in enabling the farmer to follow out closely the different subjects, which, by being treated in this manner, induce a greater interest and a better appreciation, than if dealt with by letterpress only. The editor's extensive knowledge of South Africa, and his personal attendance at shows and conferences, has enabled him, with the aid of his camera, to bring into every farmhouse which the *Journal* reaches, an amount of information and illustrative detail which the farmer of South Africa could not otherwise obtain.

You will be called upon at this Conference to deal with the Irrigation Bill, and the executive hopes that your deliberations will enable Parliament to have a clearer grasp of this important subject, and a more thorough knowledge of the requirements under this Act.

The Fencing Act will also be submitted for discussion.

The agenda is a lengthy one, and the Inter-Colonial Union, whose meetings are to be held immediately at the termination of our own, will consider and discuss all subjects affecting the four States. It is earnestly to be hoped that as many as possible of the members and delegates attending this Congress will make it convenient to be present at the deliberations of the Inter-Colonial Union.

Your executive cannot allow this occasion to pass without placing upon record the great loss it has sustained in the lamented death of its late President, the Hon. Arthur Douglass. The sudden death of Mr. Douglass coincided with the serious illness of our esteemed Vice-President, Mr. G. A. Fincham, and as a result the work of your executive was somewhat interrupted, especially in the earlier months of the year. The services of Mr. C. G. Lee were presently secured as acting president, and those of the Hon. P. W. Michau as acting Vice-President. The vacancies on the executive have, in the meantime, been filled by Mr. A. W. Douglass, whose keen interest in farming matters and knowledge of farmers generally will tend somewhat to help supply the loss sustained by the death of his father; and the Hon. W. Rogers, M.L.C., who is also a well-known and experienced pastoral farmer. Mr. Rogers fills the vacancy on the executive occasioned by the appointment of Mr. Michau to the position of vice-president, and in making this choice your executive felt that Mr. Rogers, being a member for the Eastern Circle, would worthily fill the place of Mr. Fincham, who had hitherto represented the Eastern District.

Your executive desires to convey its thanks to the Natal Government, the Natal Agricultural Union, the Maritzburg Town

Council, the Durban Harbour Board, and the Union-Castle Company, for hospitality extended and consideration and attention shewn to its members on the occasion of their attendance at the Inter-Colonial Congress in Natal.

CHAIRMAN'S ADDRESS.

The Acting President, in his opening address, extended a warm welcome to the delegates who had, doubtless at some personal inconvenience, assembled at this, the Annual Congress of the Union. He referred to the interest in agriculture which brought them together, and spoke of this industry as the one which must always be the main source of wealth to the country. He pointed out that the agenda was a lengthy one, but that it was hoped considerable discussion would be evoked, and that the deliberations of the Congress would be helpful to the Parliament of which they were all justly proud, and also be of great advantage to themselves as agriculturists.

THE ACTING PRESIDENT.

It was proposed by Mr. J. G. van Aardt (Aliwal North) that the Acting President, Mr. C. G. Lee, and the Acting Vice-President, Hon. P. W. Michau, M.L.C., be confirmed in their appointments to these offices until the close of the present Congress.

This was carried with acclamation.

SUBSIDISING WELL-SINKING.

The first item on the Agenda was a suggestion from Britstown to the effect that "Government should subsidise the sinking of Wells, same as Government subsidises for Boreholes."

Mr. J. J. W. van Zyl (Britstown) in presenting this resolution instanced the difficulty farmers often had, and especially in the Northern Karoo, in securing a sufficiency of water supply. The use of the drill was often found impracticable, owing to the scarcity of fuel for firing purposes, and the only option left to the farmer was to sink wells. He argued that an appeal to Government to subsidise well-sinking at the same rate as bores was but reasonable.

Mr. F. C. Bayly (Britstown) briefly seconded this motion.

Mr. A. W. Douglass (Koonap) did not consider it right to approach Government on such a matter. He thought that to expect the sinking of a 20 ft. well to be subsidised on the same basis as a borehole was unreasonable. Messrs. Evans and Myburgh agreed with Mr. Douglass that it would not be advisable to bring the matter before Government.

Subsequently an amendment was suggested making the motion to read. "That Government should subsidise the sinking of wells of a depth of over 50 feet where the use of the drill is impracticable." This, however, on being put to the vote was lost.

PERISHABLE PRODUCE.

Mr. H. Creed of the Cape Flats Farmers' Association moved :—
 “That Government be requested to grant better facilities for the conveyance of perishable dairy and farm produce in cool trucks on the Railway.” He said he was satisfied that this matter affected all farmers in the Western Province, as well as in other large centres, and that the present railway facilities were insufficient, as farmers could not get their produce to town early enough. It was therefore desirable that Government should provide faster and earlier trains with better facilities for cold storage.

The resolution was seconded by Mr. C. H. Willmot (Cape Flats) and supported by Colonel Warren, M.L.A., (King William's-town) and Mr. J. J. Le Sueur (Caledon).

Dr. Viljoen, M.L.A., (Caledon) cordially sympathised with the motion pointing out that the production of the Colony at the present time is sufficient to meet the requirements in the lines indicated, but that the requisite facilities to put these commodities on the market are lacking.

On the further motion of the Hon. P. W. Michau the whole matter was referred to the following committee:—Messrs Rogers, M.L.C., Warren, M.L.A., Viljoen, M.L.A., Michau, M.L.C., Lee, Rawbone, Evans, Malleson, Van der Byl and Starke.

IMPORTED LUCERNE HAY.

A motion, sent up by Oudtshoorn, that Government be required to increase the duty on Imported Lucerne Hay, in order to protect the Colonial grower, was withdrawn from the agenda in consequence of the amended tariff already in force.

AGRICULTURAL SHOWS.

Mr. J. G. Van Aardt (Aliwal North) referred to the great inconvenience occasionally induced by the clashing of dates in the arranging of Shows, and moved that:—“The Agricultural Union should receive official recognition, and that the power to regulate the dates of Shows be left in the hands of the Government.

Mr. D. M. Brown (Port Elizabeth) reminded the mover that the Union was both officially recognised and subsidised, and further stated that only twice within the past thirteen years had there been a clashing of Show dates.

Colonel Warren, M.L.A., objected to the arranging of dates being left to the Government.

On the motion being put to the meeting it was lost by 14 votes to 10.

DRIFT SANDS.

Mr. Willmot, (Cape Farmers) moved :—“That Government be asked to take into consideration the great damage done by the Drift sands throughout the Colony to Government and Private

property, and to suggest some means to prevent them spreading." This was seconded by Mr. Creed, (Cape Flats) and carried without discussion.

PUBLIC ABATTOIRS.

Mr. R. Starke, (Western Province) drew attention to the fact that with the re-imposition of the duty on imported meat there was a probability of an increase in the price of this article generally, unless Public Abattoirs were erected where cattle could be slaughtered and Colonial meat chilled and kept for distribution. He moved a resolution that:—"The necessity for action in this direction be pointed out to the Government."

Mr. W. Van der Byl, (Stellenbosch) expressed the opinion that the Abattoirs should be in pastoral districts, Mr. J. Daverin (Port Elizabeth) moved and Mr. A. W. Douglass (Koonap) seconded:—"That the matter be taken over by the Committee already appointed to deal with the question of railway facilities in connection with perishable produce."

The motion was carried unanimously.

MEAT PURVEYORS' LICENCES.

Mr. Douglass (Koonap) gave notice of motion that:—"In view of the re-imposition of the duty on imported meat, a licence of £50 should be imposed on the seller of imported meat against £5 on the seller of Colonial meat."

INTER-COLONIAL QUESTIONS.

Questions relating to the establishing of an Inter-Colonial Experimental Station for investigating diseases and plagues affecting pastoral and agricultural interests; the matter of an Inter-Colonial Scab Act; and the precautions to be taken to secure, from unauthorised use, the common seal and recognised mark of the South African Stud Book were relegated to the Inter-Colonial Union.

SCAB ACT.

The following resolution, moved by Colonel Warren (King William's Town), and seconded by Mr. J. Daverin (Port Elizabeth), was carried, with only one dissentient:—"That this Congress remit to the Inter-Colonial Conference, whose meetings shortly begin, a strong recommendation for the adoption of a practicable and stringent Scab Act." Colonel Warren remarked that as a sheep farmer he was naturally interested in this question, and earnestly desirous of seeing an effectual Scab Act in operation. He believed that scab was eradicable. His own sheep had been free for upwards of seventeen years, and it was necessary to fight against the removal of sheep by those farmers who will not take care to

eradicate scab. He considered that a good stringent workable act should be proposed by the Inter-Colonial Union, and established in all affiliated States.

OSTRICH FLY.

A resolution from Oudtshoorn, that Government be requested to take steps to combat the ostrich fly, was withdrawn by Mr. Le Roux, who explained that he found spraying with a mixture of paraffine and water a sure method of destroying this pest.

BARS IN OSTRICH FEATHERS.

Mr. Douglass (Koonap) drew attention to the work of Professor Duerden, of the Rhodes University College, Grahamstown, who was at present engaged in an attempt to discover the cause of bars in ostrich feathers, and moved that:—"The Executive Committee interview the Minister for Agriculture, with the object of having a sum of money placed on the Estimates to carry out scientific investigations into the cause, and with a view to the prevention of, bars in ostrich feathers, which are the cause of a loss of at least £200,000 per annum to this Colony; and would urge the Committee to impress upon the Hon. Mr. Fuller the necessity of having these investigations carried out in the Eastern Province, for preference in Grahamstown, under the superintendence of Professor Duerden, if his services can be obtained." Professor Duerden had gone very closely into the question, but had found it a difficult one. Mr. Douglass was sure that if the Government would make a small grant for this purpose, a remedy for the evil would be found. The resolution was seconded by Mr. Evans, and evoked considerable discussion, in the course of which

Mr. Chas. Lounsbury (Government Entomologist) said he thought the resolution a most desirable and necessary one, and that Professor Duerden was well acquainted with the ostrich and its habits.

The resolution was adopted unanimously.

TICK LEGISLATION.

Mr. Douglass (Koonap) moved, seconded by Mr. Daverin (Port Elizabeth), "That this Union is in favour of legislation for the eradication of ticks." The mover said he had this matter before him for years, and he thought they were now on the right road to secure an Act that would help farmers who have taken steps and spent large sums to get the ticks on their farms under control. He had with him the text of a Bill suggested by the Upper Albany Farmers' Association which he recommended as a workable Act, and which if applied, would eventually eradicate the Tick from the Colony. He suggested that, except in large centres, the Scab Inspector should also be the Tick Inspector. He instanced the

uselessness of having one's own cattle free from ticks if there were roads through the farm along which infected animals passed, dropping ticks as they went.

The Rev. J. Scott (President, Natal Agricultural Union) spoke of the danger of Rhodesian Red-water, which the ticks were bringing down, and of the wisdom in making preparation to get rid of these parasites. He thought the great difficulty would be in getting the natives to obey the law.

Mr. Malan (Transvaal) spoke of the importance of the subject, and approved the resolution. He was convinced that the eradication of tick would raise the value of the cattle industry a hundred per cent.

Mr. Lounsbury (Government Entomologist) spoke of the five varieties of ticks, especially the small red tick found near the coast line. He said it had been found that the African Coast Fever was carried by several of the five species.

Mr. Van der Byl (Stellenbosch) pointed out that the Tick Act would have a wider application than the Scab Act, in that it would apply to domestic animals, and care must therefore be taken that no vexatious legislation be introduced.

The resolution was carried and Congress adjourned for luncheon.

AFTERNOON SESSION.

SUPPLIES TO GOVERNMENT INSTITUTIONS.

On resuming business at 2.30 p.m.,

Mr. Douglass (Koonap) moved a resolution on supplies to Government Institutions to the effect that "(a) The Union use its influence with the Government in supporting a resolution of the Farmers' Congress that, in future, all Government Institutions should be supplied with Colonial Produce, and (b) That as an experiment, and with a view to economy, the call for tenders for the supply of Government Institutions be half-yearly instead of yearly as at present." The mover instanced the anomalous condition of things existing in Grahamstown at the present time where, at the Railway Station, Colonial cattle might be observed going out at one side, while frozen meat was being received at the other. He considered bi-annual instead of annual contracts for supplies preferable in the interests of possible local tenderers. He thought it desirable that home-grown products should have the preference over imported products in the supplying of Government Departments and Institutions.

Dr. Hutcheon (Director of Agriculture) pointed out that certain concessions were already made in this connection.

The resolution was carried without dissent.

TRANSIT OF LIVE STOCK.

Dr. Hutcheon (Director of Agriculture) presented the following report on the Inter-Colonial Regulations relating to the Transit of Live Stock, Sheep and Goats between the various South African Colonies :—

INTER-COLONIAL REGULATIONS RELATING TO TRANSIT OF LIVE STOCK.

There is very little essential difference in the regulations relating to the movement of stock from one colony to another, with the exception of Rhodesia, and certain areas of the Transvaal which are affected with African Coast Fever.

SHEEP AND GOATS.

The Cape Colony admits sheep and goats from the Orange River Colony, Natal the British Protectorate and the Transvaal after being twice dipped, the second dipping to be within 14 days of being introduced, and with regard to the Transvaal the second dipping requires to be in an arsenical dip with the object of destroying ticks. The *Orange River Colony* admits sheep and goats from Natal and the Cape Colony if accompanied by a clean certificate signed by the recognised authority. No small stock are yet admitted from the Transvaal, but regulations for their admission are being considered. *Natal* admits sheep and goats from the Orange River Colony without being dipped at the border, if dipped on arrival at their destination. From Cape Colony they are admitted through certain ports of entry on being dipped at the border. From the Transvaal sheep are admitted through certain ports if they are certified by a Veterinary Surgeon as being free from disease and have not come from an area affected with African Coast Fever, and that they have been dipped within a period of ten days, but if they come from an infected area they must be dipped at the border.

The Transvaal.—Sheep and goats are admitted on examination at the port of entry.

In Rhodesia.—Sheep are admitted if accompanied by a certificate that they are free from disease, and have not come from the districts of the Cape Colony and the Transvaal which are affected with Heart-Water.

CATTLE.

Transvaal.—Special permission is required to introduce cattle into the Transvaal, to obtain which, all particulars regarding destination and locality from which they come have to be supplied.

Orange River Colony admits cattle from Natal and Cape Colony if accompanied by a health certificate from the recognised authority. Cattle are not admitted from the other colonies.

Natal admits cattle from the Orange River Colony and Cape Colony without restrictions. They are not admitted from the other colonies.

Cape Colony.—Cattle are allowed to enter from Natal, the Orange River Colony and Basutoland if accompanied by a health certificate. Cattle are admitted from the British Protectorate if accompanied by a health certificate and are dipped at the border. Cattle are not admitted from Rhodesia and the Transvaal.

PIGS.

Cape Colony—Pigs are admitted from all the Colonies without a permit.

Natal admits pigs from Orange River Colony, Bechuanaland Protectorate, Transvaal and Basutoland without permit. They are not admitted from Cape Colony.

Orange River Colony admits pigs from Natal without a permit. From the Cape Colony importers require special permission to introduce them, and they must be accompanied by a special certificate from the Chief Veterinary Surgeon in addition to a certificate from the local authority.

Transvaal admits pigs from Cape Colony on the same conditions, no permit required for the admission of pigs from the other colonies.

Rhodesia admits pigs from Natal without permit but special permission is required to admit pigs from the other colonies.

DOGS.

Cape Colony does not admit dogs etc. from any Coast Ports North East of Durban nor from Rhodesia or the Bechuanaland Protectorate north of Palapye. But they are admitted if accompanied by the necessary health certificate from the other Colonies.

Transvaal prohibits the introduction of dogs from Rhodesia but admits them without permit from the other Colonies.

Orange River Colony has similar regulations.

Natal does not admit dogs from Rhodesia but admits them from the other Colonies if accompanied by a veterinary certificate of health.

Rhodesia.—Dogs are admitted if accompanied by a veterinary certificate of health but they must be registered at the nearest Police Station on arrival,

EQUINES.

The Transvaal.—Equines require to be accompanied by a veterinary certificate of health, and that they have been tested with mallein indicating that they are free from glanders. Otherwise they will be detained and tested at the border. Exceptions: race horses, and equines engaged in to and from transit.

Rhodesia.—Equines require to be accompanied by a veterinary certificate, and are accepted at Bulawayo, Salisbury and Umtali. But if destined to any intermediate Station special permission is required. All Equines are tested with mallein on arrival.

Natal admits Equines from Cape Colony, Orange River Colony, Transvaal, Bechuanaland Protectorate and Basutoland without restrictions. If from Swaziland or Portuguese territory they must be dipped or sprayed.

Orange River Colony.—Equines are admitted if accompanied by the required certificate of health.

Cape Colony.—Equines are admitted without restrictions except from Rhodesia I think, however, that it is time that we imposed some restrictions.

HORSE AND DONKEY BREEDING STALLIONS.

Considerable discussion took place on a recommendation sent up for consideration by the Bredasdorp Agricultural Society that "It is desirable that the necessary steps be taken towards securing a suitable class of horse and donkey breeding stallions, by preventing the existence of such stallions as may be considered under a certain standard stipulated."

The Bredasdorp delegates being absent, and as some uncertainty existed as to the meaning and extent of the recommendation, the matter was referred to the Executive with power to act.

Mr. Myburgh (Western Province) then gave notice of motion that "Government be requested to make a further importation of Donkey Stallions."

CATTLE CROSSING THE FRERE BRIDGE.

Mr. Kidwell (Aliwal North) moved the following resolution on the Agenda:—"That the restrictions on Cattle and Sheep crossing the Frere Bridge and brought into the Colony for sale, be modified, as the present system operates harshly." He pointed out that the hardship lay in the fact that whereas sheep sent into the Orange River Colony were admitted on the production of a certificate from landowners this side; sheep entering from the Orange River Colony had to be twice dipped.

Mr. Nicholson (Transvaal) referred to the restrictions between the Transvaal and the Orange River Colony. Before crossing, the sheep had to be dipped twice within 14 days, and on the last occasion within 3 miles of the border. It was also necessary to have the attendance of a Veterinary Surgeon of the Orange River Colony at the second dipping, and to obtain his certificate. An attempt had been made to secure a modification of these restrictions, but the Orange River Colony, would not amend the present laws.

On the motion of Mr. Douglass (Koonap) the matter was referred to the Inter-Colonial Union.

STUD ANIMALS.

A recommendation from Darling to consider the advisability of Government qualification for Stud Animals used in the Colony, was on the motion of Mr. Evans, also remitted to the Inter-Colonial Union.

MANGE IN HORSES.

Mr. Douglass (Koonap) moved and it was decided to withdraw from the Agenda a recommendation received from Bredasdorp that "The Union urge upon Government the necessity for taking compulsory measures to stamp out Mange in Horses."

THE STUD BOOK.

The question of securing from unauthorised use the South African Stud Book's recognised Mark and Common Seal was remitted to the Inter-Colonial Union.

FERTILIZER ADULTERATION BILL.

Mr. Ryan (Western Province) moved:—"That it is highly desirable to have the Fertilizer Adulteration Bill, which it is understood has already been drafted, brought before Parliament during the coming session." He believed there was a Bill ready to be brought forward, but that it was now pigeon-holed. It had been carried over from last session owing to pressure of work, and it stood a good chance of being again carried over for the same reason. A strong representation from the Union will doubtless help Parliament to move in the required direction:

The motion was carried unanimously.

A further recommendation, appearing on the Agenda, that renewed attention of Government be called to the need of protection of Farmers against sale of Fertilizers and Seed, either not good, or fraudulently adulterated, was dropped, as provision in this respect is made in the above-mentioned Bill.

LUCERNE AND DODDER.

Mr. Richards (Sundays River) moved a resolution which, after amendment, was adopted as follows:—"That to check the sale of lucerne seed, Government be asked to pass an Act under which all lucerne seed must be free from dodder." The mover spoke of the difficulty of getting good seed now as compared with six years ago. He imported it with a guarantee, but after sowing and when beginning to reap found an abundance of dodder. He considered that what was now wanted was an Act making it necessary that seed be examined and passed before being admitted to this country. Lucerne was rapidly taking a foremost place in the products of the country and was becoming a necessity for cattle, sheep, pigs, ostriches etc. A long discussion followed in which Messrs. Evans, Daverin, Douglass and Brown took part.

Mr. De Wet considered it advisable not to permit the sale of lucerne seed from any land in which dodder appeared.

Dr. Hutcheon thought it impossible to impose such restriction.

Dr. Nobbs said the great interest evinced in this subject was a testimony to the importance of the matter. He was glad to say that the Fertilisers Adulteration Bill would, to some extent, deal with this question. Usually the local guarantee given is that to the best knowledge and belief of the seller, the lucerne contains no dodder, that the seed is collected from lands free from dodder and packed into clean bags. Such guarantee is however only a moral one as there are many means by which dodder may be unconsciously added, by birds or threshing machines etc. It is impossible to guarantee absolutely pure seed. The Argentine standard is 1 dodder seed to 476,000 lucerne seeds and as there are 231,473 lucerne seeds to the pound, this gives an average of 1 dodder seed to 2.2 lbs of lucerne seed. When examining a quantity of seed the expert condemns the whole parcel if the proportion is greater than that indicated. With regard to wild dodder in river beds, no reliable proof had been secured to shew that this affects lucerne under cultivation, but if this is so, steps should be taken to bring this under the Noxious Weeds Act. He favoured the supervision of both imported and colonial seed as legislation on these lines would give farmers greater confidence in their purchases made.

At this stage Mr. C. G. Lee introduced Mr. D. Alexander (President of the Inter-Colonial Union) who received a warm welcome, and who expressed his appreciation of the progress made since he last visited the metropolis and hoped to note similar progress in the country districts which he shortly intended to visit.

DESTRUCTION OF JACKALS.

Owing to the absence of the Delegates from Bredasdorp a resolution submitted from that centre:—"That it is the opinion of this Union that a higher reward be offered by Government for the

extermination of Jackals and other destructive wild animals," was, after a brief discussion, removed from the Agenda.

WOOL INDUSTRY.

The following recommendation from the Bredasdorp Agricultural Society was next considered :—" That in order to bring about a satisfactory system of the sorting and packing of Wool, experts be available for instructing Sheep farmers in the several districts where necessary."

Mr. Daverin (Port Elizabeth) in moving the resolution, said that at a meeting of the Wool and Mohair Growers' Association, recently held in Kimberley, a resolution had been passed that two other experts should be appointed to give instruction in the classification of wool. Our Cape wool, so far as type is concerned is equal to the Australian, but a better condition is required. Endeavour was being made at the present time to improve Cape wools, and these are gradually regaining their position in the markets of the world.

Mr. Le Sueur (Caledon) in seconding the motion referred to the careless sorting of farmers in the past, but greater care was now being exercised, and the result was seen in the better prices realised.

The Hon. P. W. Michau thought it would be advisable if young farmers were given special facilities to accompany the expert round the country to ascertain how the work was being done, and mentioned his intention to make this suggestion in the Legislative Council. The resolution, on being put to the Congress, was carried unanimously.

INTER-COLONIAL AGRICULTURAL JOURNAL.

Mr. Nicholson (Transvaal) introduced the subject of the establishing of an Inter-Colonial Agricultural Journal. After some discussion it was agreed that it be an instruction to the delegates from this Union to the Inter-Colonial Union to vote against the establishing of such journal.

The Congress adjourned at 5 p.m. until 9.30 next morning.

To be Continued.

TICK ERADICATION.

McDougall's Dipping Tank at East London.

By the courtesy of Mr. McDougall, junr., who has been supervising the work of construction we have been favoured with the accompanying photographs of the opening of the McDougall Dipping Tank at Ferndale on the West Bank of the Buffalo at East London. The *East London Despatch*, gives the following particulars.

Messrs. McDougall have spared no expense or pains in the construction of their dip. Their representative (Mr. McDougall, junr.) is both enthusiastic and practical, and their travelling representative (Mr. Hill) is brimfull of his successful experiences in the Komgha and other "tick" districts.



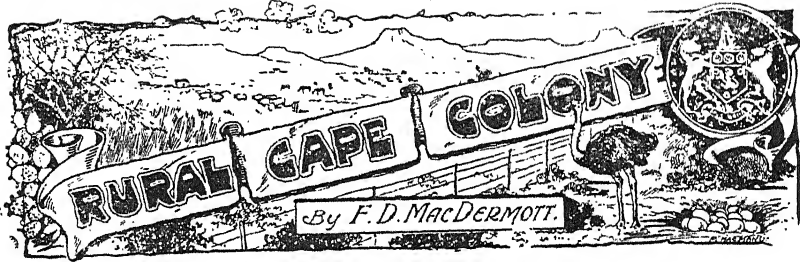
Watching the Cattle going through the Tank.

The "dip" itself is an object lesson, Mr. H. D. Pearce (of Pearce and Pearce, architects), has had the work of both designing and supervising the construction. The whole length of the "dip" is 76ft. 6in., and the "swim" 71ft., with a depth of 6ft. 6in. The entrance to the tank is of solid concrete work, the "take off" being well arranged, while the "dipping race" is also of stone embedded in concrete. The capacity of the tank is 6,360 gallons. The whole enclosure leased by Messrs. Dougall is well and substantially fenced, with receiving-kraal, crush-pen, etc. The whole "job," in the opinion of practical men, reflects the greatest credit on Mr. H. D. Pearce, who has been both architect and advisory builder.

During the proceedings 400 cattle, 40 goats and 12 horses, were passed through the dip. Many of the cattle gave trouble—being their first experience—but with the help of a staff of men, including Messrs. McDougall, A. R. Turner, Oliver Lloyd, Brill, Hill, Webb, and others—all difficulties were overcome.



McDougall Dipping Tank showing Cattle Swimming.



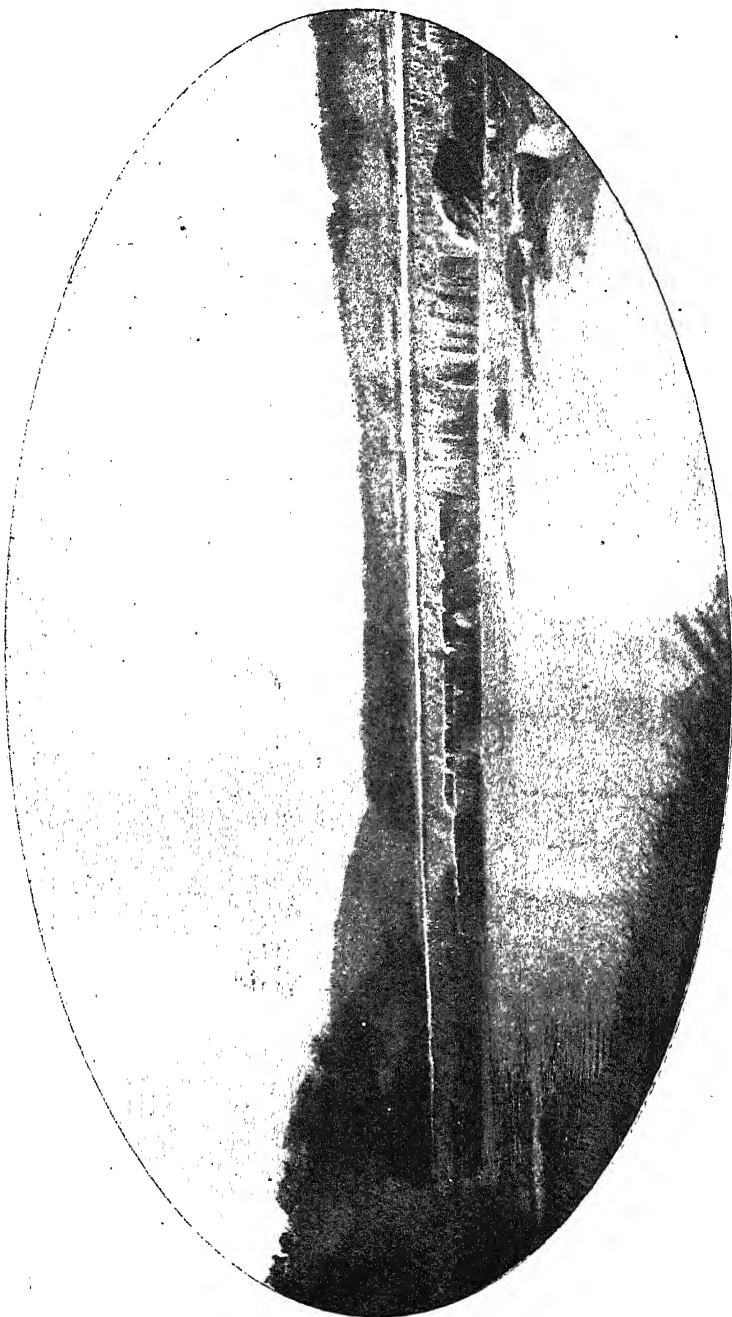
NO. XX.

IN THE DISTRICT OF CRADOCK.

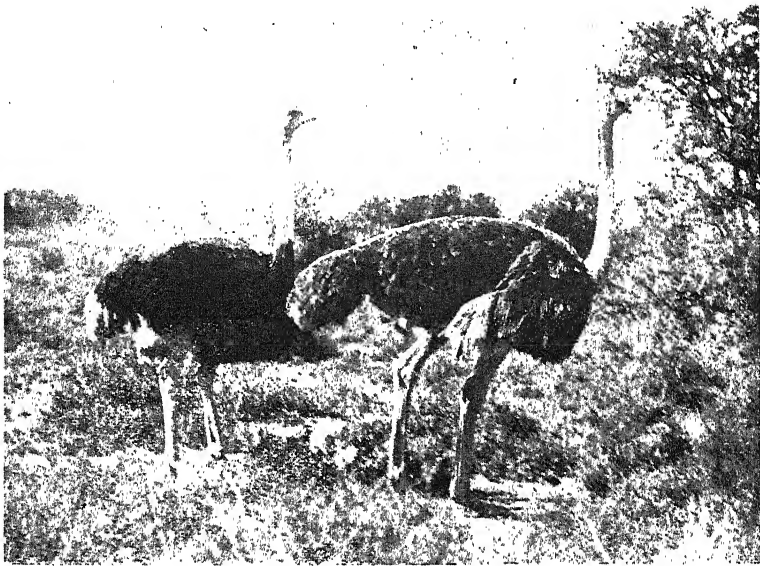
FLOOD IRRIGATION ON THE FISH RIVER.

Cradock, as a District, with its magnificent climate and the general advance of irrigation in the river valleys, where the soil is usually very rich, bids fair to become in time a great pastoral section. The farmers who are now making most rapid headway there are those who are utilising flood waters for irrigation and conserving the storm waters in dams for the same purpose. The advantages derived and derivable from the former line of policy are remarkably instanced in the valley of the Fish River, the main artery of the whole district. Along its banks an energetic population of irrigators is growing up that must in time have a great influence for good on the fortunes of the farmers and business people of that region. I have not, as yet, had the opportunity of visiting the whole or even an important portion of the farms along this fertile valley, but having a couple of days to spare between the Cradock and Grahamstown Agricultural Shows I spent them in a most profitable manner by calling upon a couple of the best known of the many energetic men of the district. In looking in upon Mr. Hilton Barber at Hales Owen, and Mr. Herbert Collet, at Saltpan Drift, just close to Fish River Station. my object was to get some idea of what was going on in this part of the country, and I found that to render it full justice I should need to spend a considerable time among the farmers and then I would only be seeing a tithe of what is to be seen.

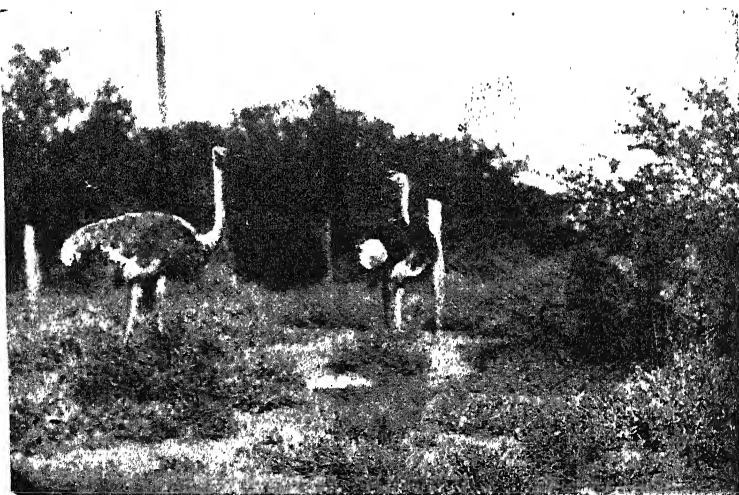
The Fish River is one of the most characteristic of our South African streams. At some seasons it rolls down in mighty floods



Weir on Fish River at Hales Owen.



A pair of Notable Breeding Birds at Hales Owen.



Ostriches of "Jack" Strain with Nest at Hales Owen

carrying its myriads of gallons of water off the lands to the sea: at others it barely justifies its name as a river, for it seems to consist for the most part of a continuous string of pools in a sandy bed. Yet it is very seldom indeed that there is not water sufficient to keep the irrigable lands along its banks from suffering the pangs of serious drought; and for this reason it can be justly claimed that those who have cast in their fortunes with its erratic course have very little cause for serious regret. Its course is lengthy and tortuous, being, in fact, one of the longest rivers in the Colony. As a result the drainage area it serves is something enormous. As a rule it runs strongest during the spring and summer months when the thunderstorms and their attendant rains are most frequent in the Karoo and in the mountains which rise in sullen splendour in the hinterland. The irrigators, however, are not entirely dependent upon the summer storms; for it frequently happens, notably in seasons like that of 1905, that winter or early spring rains drive across the country which bring heavy snows to the mountains. When this occurs the river will flow steadily for weeks at a stretch, throughout the period usually dry all through the regions coming within the influence of the eastern rainfall.

With such advantages it will not surprise many to learn that the system of farming has become revolutionised there during the past decade. Time was when the struggling agriculturist wasted his efforts in vain endeavours to oppose the natural conditions and make a living out of steady attempts to raise white crops. All that, or at least most of it, is changed. There are, it has to be admitted, still a few who courageously stick to the old methods. The irrigator now pins his faith to lucerne. And it is not only the farmer with his hundreds of acres of irrigable land who is thriving on the "king of fodder plants." One of the commonest sights from the train, as one travels for miles along the banks of this river, is the small patch of green, thriving alfalfa watered by a windmill from the permanent pools in the stream. The soil on the river banks is remarkably rich and deep; it teems with organic matter, being largely silt washed down from the Karoo, and is well supplied with lime. It is easily worked, being loose and friable once it is broken in, and responds with marvellous generosity to regular cultivation under irrigation. The only regrettable feature of the situation is that there is not a greater extent of this wonderful soil available for irrigation purposes, but the contour of the country is so steep as a rule, as to render doubtful the possibility of anything approaching a gigantic irrigation scheme. There are, however, many places along the river where great things may yet be accomplished, and others where smaller schemes, backed by industry and energy, should bring grand returns to the men who have the courage to initiate, and the patience to develop them. Leaving possibilities aside for the moment, let me turn to actualities, and shew what has been

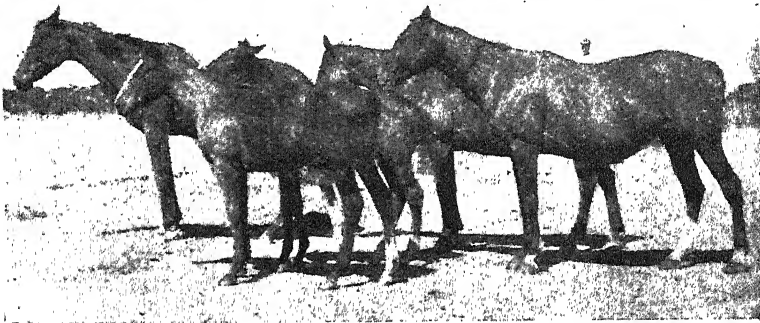
done by at least two energetic men who have devoted their lives to the betterment of the conditions in which they found themselves. As a beginning I will take my readers with me to

HALES OWEN, THE HOME OF MR. HILTON BARBER.

There are few better known figures in this Colony either at Agricultural Shows or farmers' gatherings than that of the hale and genial Squire of Hales Owen. He and his stalwart sons have made a name throughout the Eastern Province—and even much further afield, for the Barbers have been associated with sport and adventure for years past—which must live for many generations yet, and when dealing with a place like Hales Owen one can only approach it with a sense, almost, of the historical. As history goes in this country this farm has had a good deal to do with the making of many important phases of advancement—I speak of course entirely in the farming sense. For many years Mr. Hilton Barber devoted his attention to stock-breeding and in his day he has ranked among the foremost of our breeders of Thoroughbred horses. In this connection he will always be remembered; for, in the days when the breeder invariably raced his own stock Mr. Barber took high place with Mr. Charles Southey and other well-known sportsmen. Among some of the better known Thoroughbreds associated with Hales Owen, were Skylark, Queens Message, Buxton, Maid of Honour (bred here) Marquis and Lammas. But it is not only in Thoroughbred horses that Mr. Barber has achieved success. He has also gained both "credit and renown" for many years past for the splendid type of ostriches he has bred. It is not so long since that the ostrich world was thrilled by the news that a pair of selected birds had been sold for the enormous sum of a thousand pounds sterling. These birds were from the Barber stock and there are some who hold that there are as good fish still in that particular sea as ever came out. The pastoral side of this farm also includes cattle, sheep, and angoras, the latter having been a feature for many years past.

Now the success which has followed the industry of the farmer here is not, as some might be inclined to think, sheer luck. It has only been attained after years of hard concentrated work, and by overcoming the natural difficulties which barred the way. The greater part of it is due to well-directed irrigation. The farm lies in a picturesque hollow on the banks of the Fish River. On the one side, towards the west, the land slopes gently upwards, and towards the south takes in a fine sweep caused by a bend in the stream which offers immense possibilities for irrigation farming still. Above the farm, in the direction of Cradock—which, by the way, is only some eight miles distant—a natural barrier of rock crosses the whole width of the stream. This occurs on the adjoining property

but as it was the one spot within reach which provided the requisite conditions for successfully gravitating the water on to at least a portion of the lands available, Mr. Barber arranged with his neighbour to construct a weir there, and has never since regretted it. The results have been so favourable that when I was on the farm, the level of the water was being raised, and the old furrows widened and deepened in order to still further increase the amount of land available for irrigation, and as time goes on there seems little doubt but that the works will be further improved, so as to provide for even greater developments. All this has not been accomplished without great labour and expense and much trouble and thought. But there it stands to-day, a model in many senses ; and sufficient at least to put heart into any man similarly situated. The main furrow as it now stands is eight feet wide and two miles long. When completed it will be about four miles long, and will water over seventy-five acres of lucerne. There are well over



Brood Mares and Foals at Hales Owen.

fifty acres of lucerne well established, and in the near future this must be largely increased, in fact the seventy-five acres laid out at present should be doubled in time. The value of this crop in a section subject to periodic droughts can scarcely be estimated, and when it is realised that Mr. Barber has known the time when it has cost him hundreds and hundreds of pounds to feed his stock during such trying periods, the changed conditions will be the more readily apparent. *Paspalum* grass is growing here very successfully, and is greedily consumed by the stock.

There can be no two opinions as to the value of irrigation in such circumstances. And it is to be hoped that many more will follow so excellent an example. It may not fall to the lot of every farmer similarly situated to be so fortunate as to be able to take advantage of the flood waters that now run past his door to the same extent as is done at Hales Owen, but there are very few who could not, with a little ingenuity and energy accomplish something

in the same direction. It is the remarkable returns that are gained from a crop like lucerne which make the prospects so promising, for even a small patch in a warm climate with good soil is worth a great deal of trouble to establish. To realise what the full value of this wonderful fodder plant really is, one has to turn to the records of other countries where they have worked out these problems for themselves. For instance, the Royal Commission for Water Supply, which sat in New South Wales some years ago, ascertained that ten acres of lucerne, raised by irrigation for ensilage, would provide for a herd of two thousand acres of pasture-land during a season of drought. (Mueller's "*Select Plants*.") And for ostriches it stands, so far, unrivalled." Now the conditions of the Karoo in

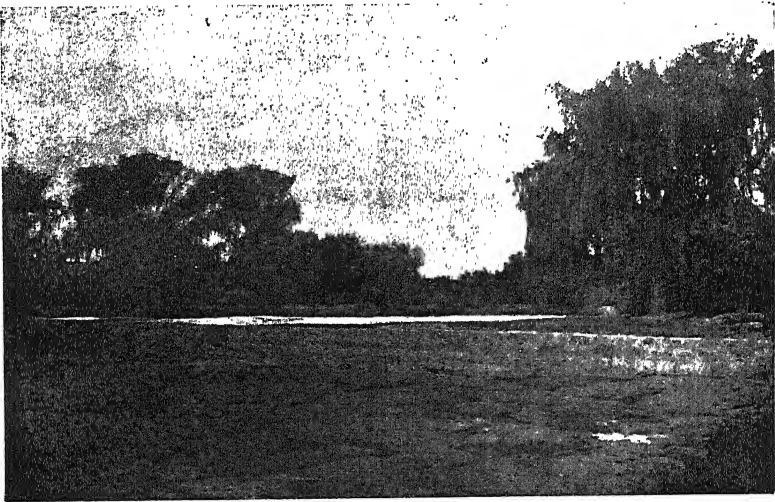


New Homestead at Hales Owen built by Mr Grey Barber.

this and adjoining districts are almost perfect for this crop ; all that is needed is to secure sufficient water for irrigation purposes, so that there can be little question as to the tendency of the future in this part of the country.

It would be far from satisfactory to leave a farm like Hales Owen without some reference to its most important feature, namely the special breed of ostriches. Among the birds shewn in the illustrations are some remarkable types. The most remarkable, perhaps, is the bird known as "Jack," a fine old cock, the progenitor of a notorious race. This bird is thirty-one years old, and is as vigorous as ever. It was from this strain that the now famous "thousand pounders" are descended, and the pair shewn in the

illustration with the eggs in the nest between them are of the same family. Our farms are now rapidly establishing some very fine types of ostriches by care in selection and breeding, but very few, even of the most successful breeders, can shew anything much better than these. The virtue recognised in this strain of bird is the accuracy with which they transmit their good points to their offspring. This is a virtue very difficult to achieve in ostriches. There are many beautiful birds of both sexes in the country; but he is a fortunate breeder who can mate them successfully. The method of handling the birds in the breeding camps is another point worth noticing. I went through the camps—which are all under lucerne—with Mr. Harry Barber, and we moved about among the birds as easily as one could go through a flock of sheep. I do



Mr. H. Collett's Weir on the Fish River,

not say that I could have done this alone, but merely to shew how thoroughly well handled the birds are and how little irritation they are subjected to. Great care is devoted to the rearing of the chicks, as they are found to suffer from various ills, unless they are carefully attended to. Shelter from the heat of the sun is provided by means of bush screens.

SALTPAN DRIFT, THE HOMESTEAD OF MR. H. COLLETT.

On leaving Hales Owen I ran up the line and looked in on Mr. Herbert Collett, at Saltpan Drift, within a stone's throw of Fish River Station. As every one knows who has travelled over the Midland line of railway, the Fish River is bridged at this point for the rails to cross. And many must have noticed the long

stretch of cultivated land which lies below the railway with the lengthening lines of irrigation furrows leading out of the river. This is but the beginning of Mr. Collett's admirable labours. If one leaves the train and moves down the road leading from the station for a few hundred yards, he will see an excellent masonry weir in the river bed with more furrows leading out the impounded waters above, and by going a little further along to the left he will see another broad stream with yet another masonry weir flung across its full width—with more furrows. This, with yet another weir higher up, is all the work of the apparently tireless owner of this property. By following either of the two large streams mentioned a little lower down, he will find the banks heavily cultivated with lucerne, and can ride through these fields for an hour

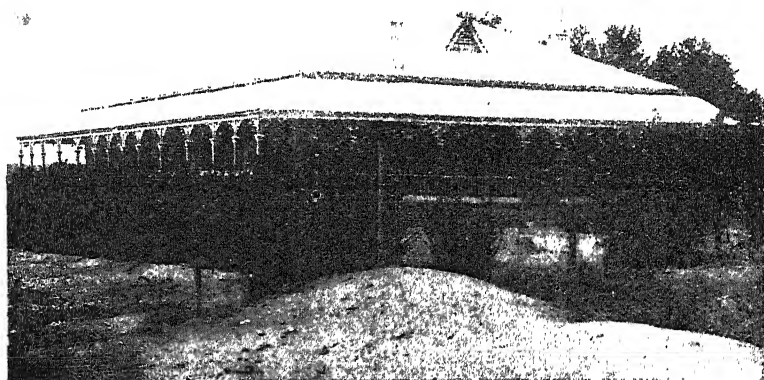


Brood Mares and Foals property of Mr. H. O. Collett.

or more without coming to the end of them. If he is fortunate enough to hit a time when the crops are being cut he will see a busy and inspiring scene with men, teams of mules, and mowing machines, filling the landscape with life and activity. In other words, we have here a development which almost borders upon the marvellous; that is no less than a couple of hundred acres of well-established lucerne, with flocks and herds, and troops of ostriches and horses, where a few years ago the farmer could not make even a bare living. When Mr. Herbert Collett took this farm over the conditions were most depressing. His predecessor, one of the old school, who tried to grow white crops in the face of natural difficulties, had practically lost his all in the struggle. In those days, when a man was ultimately forced to give up his farm through

misfortune, there was seldom much left for those who came after him. But Mr. Collett could see a little further into the future.

The farm is situated at the junction of the Great Brak and Fish Rivers. The Brak River is the stream which flows past Varkenskap, and which, in the hands of Mr. Wm. Southey, has done so much to reclaim another barren stretch. This was good enough for Mr. Collett, and he went to work patiently and wholeheartedly, and is still making plans for further extensions. One of the most pleasant experiences I have had in this country was riding through this valuable property, listening with unflagging interest to the calm optimism of the man who in so unostentatious a manner had performed what would have been considered a miracle a few years ago, and who still sees greater things ahead. If anyone knows the Fish River and its possibilities intimately, it is Mr. Collett, and he views the future with an unbounded hope that com-



Mr. H. Collett's Homestead.

pels faith in his optimism. For all that he is conservative. He wants nothing done in haste. It has taken him many years of hard thought and harder toil to achieve his present position, and he cannot see any ready road to success in the same direction without at least a modicum of these sound virtues. But he is a firm believer in irrigation, provided the schemes and plans are carried out with care and patience. He is one of those who has a high opinion of the effort of the individual, and hopes to see irrigation forwarded on such lines as will bring individual effort to the fore. In the valley of the Fish this view seems to fit the conditions perfectly. Here and there it may be possible to bring a few hundred acres under a furrow in one block. But there are, according to the information I was able to gather, many more places where small areas should be served cheaply. The more conserva-

tive calculations of the men on the spot are, therefore, fully worthy consideration.

A better idea of the extent of the irrigation works can be obtained when it is stated that there are $10\frac{1}{2}$ miles of furrows on this property. The full extent of the farm is 9,000 morgen, of which 3,000 are mountain veld. The whole is devoted to stock, and little is sent away except as animal products. Lucerne hay is sometimes sold, if buyers offer, but it is considered just as valuable on the farm as the money it brings in, so there is little fear of this property becoming a serious competitor for that trade, although so well situated, being close to Middelburg, where the military consume large quantities of this fodder. Mr. Collett can always use his hay, and, like a good many more in these parts, prefers to have a good store of stand-by fodder in case of a prolonged drought.

An attempt was made here to introduce *Paspalum* Grass, but for some accountable reason, a very large sowing of this seed failed entirely. Mr. Collett still has hopes, however, of establishing it in the irrigated sections.

Horse-breeding, mules, and ostriches are a strong feature. These, with cattle and sheep, make up the staple products. In horses the present aim is the utility animal, and in this line Mr. Collett has been very successful. He has been breeding for some time past from mares of substance mostly of the Hackney type, with some thoroughbred blood. Comparatively recently, however, he introduced a Hunter stallion into his stud, and this animal is thought a good deal of in this district. "Balfour Brown" (the stallion in question), was placed first and champion at the last Cradock Show, and some of his young stock were spoken of very highly, and also took prizes. He is an excellent type of his class, and is by a Queen's Premium stallion out of an Irish Hunter mare. The brood mares in use are largely of the Hackney type, giving bone and substance, two points much appreciated in a district where workers are wanted. In mule-breeding he uses a Catalonian jack, and gets excellent foals. There is never any difficulty in getting rid of these. In point of fact the mule is coming very much into favour as a farm animal in the Midlands, and in time this industry promises to take a leading position. With good mules the light work of the farm, like mowing, is so easily handled that they are indispensable where crops like lucerne are grown.

INTER-COLONIAL AGRICULTURAL UNION.

Second Annual Congress, May, 1906.

The second Annual Congress of the Inter-Colonial Agricultural Union was opened in the City Hall, Cape Town, on Wednesday, May 30, 1906, when the following delegates attended :—

TRANSVAAL.—Messrs. J. E. van der Merwe (President, Transvaal Agricultural Union), Potchefstroom; A. H. Malan (vice-president), Standerton; A. G. Robertson (vice-president), Wakkerstroom; P. van der Venter (vice-president), Pretoria; and F. T. Nicholson (Secretary, Transvaal Union), Pretoria.

NATAL.—The Rev. James Scott (President, Natal Agricultural Union), with Messrs. C. E. Hancock, John Moon, William Craig, and J. H. Holley.

CAPE COLONY.—Messrs. C. G. Lee (President, Cape Agricultural Union), the Hon. P. W. Michau, M.L.C. (vice-president), O. E. G. Evans, D. de Wet, P. R. Malleson, Col. Cuming, P. Ryan, J. Daverin, W. van der Byl, and D. M. Brown (Secretary, Cape Union).

GOVERNMENT REPRESENTATIVES.—For *Cape Colony* : Mr. D. Hutcheon, Director of Agriculture; Mr. Charles P. Lounsbury, Government Entomologist; Dr. E. A. Nobbs, Agricultural Assistant; and F. D. MacDermott, Editor, *Agricultural Journal*. For the *Transvaal* : Mr. C. E. Gray, P.V.S., and Mr. C. B. Simpson, Government Entomologist.

THE PRESIDENTIAL ADDRESS.

The President (Mr. Geo. D. Alexander, of Natal), in opening the proceedings, delivered the following address :—

Gentlemen, I beg to welcome the delegates to this the second meeting of the Inter-Colonial Agricultural Union, and I trust that the result of this Conference will be to strengthen and increase the value of the Union. I do not think the benefit of such a Union as this has been fully realised, and it is a matter of great regret to me that all the Colonies and States of South Africa are not fully represented; I hope, however, that those Colonies that are represented

will determine to carry on the work of the Union until these Colonies that are standing aloof are prepared to join. A strong Union with a proper organisation, as I earnestly trust this will eventually become, cannot be established in full working order without considerable work and time, and as it is only some seven months since the Union first met and appointed office-bearers, it will be understood that there is a great deal of work to be done before the organisation is complete, and it may be necessary to alter some of our rules, and to build up our organisation before the Union attains to full usefulness. I remember the Natal Agricultural Union some ten years ago was a comparatively insignificant body and without much organisation, but to-day it is, as the Press and the Colony admit, a power in the land in Natal, and this has only been brought about by perseverance and combination. It has now affiliated to it societies and associations representing quite two-thirds of the population in Natal. The Cape Agricultural Union is, I understand, a much older institution, and represents a large majority of the farmers in the Cape Colony, and has done a very great deal of work in the interests of the farmers and of the Colony. The Transvaal Union is also a well-organised and valuable body and, in the face of considerable handicaps, has become a powerful Union, that, when the Transvaal receives Responsible Government, will reward those who have laboured to bring it to its present state of efficiency, by becoming a factor that will have to receive consideration from the Government. These Unions have been working and paving the way for an Inter-Colonial Union, and the Inter-Colonial Union must set to work to build up a constitution that will in time voice the feeling and wishes of the majority of agriculturists of South Africa, and when that day comes—and recent events have shewn that it is drawing near much more quickly than might have been expected a year ago—when there is a Federation of South Africa, the agricultural population will be in a position to watch that their interests are safeguarded. If every farmer joins an association or society in his colony, and that association or society is affiliated to the local Union—and that Union is affiliated to the Inter-Colonial Union—it will be the fault of the Agricultural Union if their interests are not protected and furthered, and fully and clearly placed before the Governments of South Africa. We must work together for the general good of South African agriculture—English and Dutch—High Veld and Low Veld, North, South, East, and West—we must sink all differences and work together not for any nationality nor for any section, but as South African farmers for agriculture and for our land, whether it be the land of our birth or the land of our adoption. There is a degree of Freemasonry amongst farmers, and I believe that we can do more to help to bury racial animosity and bickering than any section of the community, and I earnestly hope one and all will strive to do so—the friction that some are trying

to bring about, and of which we have had recent evidence, can only lead to unrest, unhappiness, and retrogression. Politics are, I am afraid, not altogether inseparable from the discussion of agricultural subjects; they have a way of cropping up in the most unexpected manner, but I trust, as far as possible, that politics will be eliminated from the discussions of this Union. The great need of South Africa is a larger agricultural population, and no effort should be spared in endeavouring to bring about a settlement on the land. It is of vital importance to South Africa generally and to the farming community particularly from the point of view that unless the agricultural population is increased, it will in time be swamped politically by the labour vote. But unfortunately the conditions of agriculture in South Africa make it necessary that we must hasten slowly, and I fear that much money and energy has been wasted in the past by over-looking the fact that what has proved a panacea in other countries is not suitable when applied to this. A recent writer in an article contributed to the Press says: "All the failures which have resulted in the past in the respect of the settlement of agriculturists would appear to have arisen from the one fundamental mistake—which has been repeatedly made—of thinking that what is suitable for other countries must necessarily be suitable for this. We are not Egyptian fellaheen, Indian ryots, or Danish peasants, and the modes of action which may serve to place the former in a position of comparative comfort in their own country will not necessarily meet with the same success in dealing with the immigrants in this country. We must learn to suit our actions to our actual surroundings and brush from our programme the exotic ideas which have so frequently led to absolute failure." It would be of great value if farmers and those who represent them in the Legislature would take a greater interest in endeavouring to find out what lies at the root of the slow progress of agriculture in South Africa, and advise the Governments how the disabilities could be removed. If more earnest endeavour had been adopted in the past by practical men towards this end and Government had listened to the conclusions, many hundreds of thousands of pounds would have been saved; and the prosperity of agriculture would be much greater to-day. To my idea we must do more than has been done in the past to first of all remove the disabilities that exist before we can hope for a large influx of agricultural population. The greatest disability is, I hold, the presence of stock diseases, and the investigation of these should demand and receive attention from the whole of the South African Colonies, to a much greater extent than in the past, and those members of the Legislative Assemblies who represent farming interests should strive to get the different Governments to expend sufficient sums of money and to grant sufficient facilities to have the principal stock diseases investigated. Much valuable investigation work has been done, and both the Cape and the

Transvaal have, with the services of the capable and scientific gentlemen whose services are available, done much to throw light on many matters connected with stock disease; Natal also has contributed her quota, but although the staff is as keen and eager as any in South Africa, its efforts have been restricted, owing to a short-sighted policy of false economy and a want of recognition on the part of those supposed to represent the farming interests, of the immense importance and necessity of funds being expended in the direction of such investigations. If scientific investigation resulted in the discovery of means for eradicating, preventing or ameliorating some of the diseases such as redwater, heartwater and specific pneumonia in cattle, horse sickness, biliary fever and bluetongue in horses, bluetongue and heartwater and other diseases of sheep, and the so-called fowl sickness in poultry the advance in prosperity of agriculture would be very much more rapid, and it would be of far more benefit to the whole of South Africa to provide the necessary money and facilities for such investigations than to spend large sums on trying to introduce methods because they have proved successful in other countries. Think of what it would mean if we could improve the class of cattle by large importations of high-class stud animals from Europe, as has been done in the Argentine, Australasia and Canada. It would mean that we could produce dairy produce as cheaply in this country as is done in those Colonies—and we would be in as favourable a position to export. The same applies to the raising of beef and mutton. The tendency has been in the past to preach the introduction of scientific methods of farming and to overlook the necessity of preparing the way to allow of those methods being successfully adopted, and to get settlers on the land before it has been made possible for settlers to thrive. In my annual address to the Natal Agricultural Union, I endeavoured, for the benefit of those gentle critics who are always harping on the matter that farmers do not produce more, to shew why such produce as butter, etc., is not produced in larger quantities and at a cheaper rate. The average Colonial cow will not produce more than about $2\frac{1}{2}$ lb. of butter weekly, say at 1s. per lb.—2s. 6d. Good milking breeds of cattle will produce 1 lb. per diem or 7 lb. weekly, say at 8d. per lb—equals 4s. 8d. Therefore if the farmers in the colonies or countries where good milking breeds are available get 8d. per lb. for their butter, it will pay them better than farmers in this country, who get 1s. per lb. The investigation of several diseases have proved that many are conveyed by insects, and I think the tick takes premier place as a conveyor of disease. It has been found within the last few years that the tick can be greatly reduced in numbers by dipping, and the system of dipping as practised in Australia was first introduced into South Africa by the Hon. Joseph Baynes, of Natal, who, when he realised the value of the dipping, did all he could to disseminate information

throughout South Africa, and I am very pleased to note that the dipping question has been taken up very keenly, and efforts have been made—and, I understand, with success—to discover a dip that will be cheap, efficacious, and at the same time give the minimum of discomfort to stock. In this matter I think the Cape has taken the lead, and the destruction of ticks will ultimately allow of large tracts of country being reclaimed for stock-grazing that for many years have been unusable owing to the presence of the tick plague, and I feel sure that in many parts where dipping is regularly and carefully carried out, the deaths from disease will be very much diminished. The advance of the deadly East Coast fever has been checked, and the knowledge gained in the best method of dealing with the outbreaks of the disease is proving of immense value. The thanks of agriculturists in South Africa are due to the Governments and to the veterinary staffs for their endeavours to check the spread of this terrible plague, and I would offer a special vote of thanks to Mr. Lounsbury for the very great service he has rendered in his investigations of how the disease is carried by the tick, which information has provided the knowledge of how to deal with infected herds to reduce the deaths to a minimum. Nor can I fail to recognise the work of Drs. Hutcheon, Theiler, and Robertson, and Mr. Woollatt, of Natal, in their endeavour to fight the advance of the dreaded disease, nor the many gentlemen who have laboured in connection with the investigation and control of the disease. I am optimistic with regard to the future of South Africa as an agricultural country, and I am hopeful when I note the progress that has been made since I first came to this country some twenty years ago. I do not think there is any other country in the world so hard to win for agriculture, but the agricultural community have grit, and though they get one buffet after another, they come up smiling, and win their way a little further every year. The special correspondent of the *Daily Mail*, writing from Johannesburg in January last, said :

“South Africa is termed a white man’s country. But if providence meant it to be so, it also determined that it should be hardily won. The rapid settlement that folks at home expected three years ago is something never before known in the history of this sub-continent. No part of the country, from the Cape to the Barotsiland, has become the heritage of the white man with ease. Most of those who travel through the pleasant districts of the Cape to-day forget that the moderate amount of prosperity arrived at represents three and a half centuries of slow and patient conquest by some of the hardiest men of the Dutch and British races. Read the story of the Albany settlers and judge if the Cape was easily won.” In spite of the war, diseases of stock and plant life, in spite of drought, locusts, ticks, and many other drawbacks, agriculture is slowly but surely forging ahead. It may be something like a sailing

vessel trying to make headway with the breeze dead against her. She has to travel a long way by tacking to make any progress on her journey, and the onlookers may think she will never reach port. But we'll get there some day, and perhaps be all the better men for the lessons of patience and perseverance, and the resourcefulness developed in overcoming difficulties. I have to ask your kind indulgence if the work of this Union has not been carried on as energetically as it should have been since our last meeting. But there has been trouble in the land, and Natal has been and is struggling with a big question in the rebellion of some of her natives. Your Secretary, Mr. Eadie, belongs to one of the Volunteer regiments, being an officer in the Artillery; he was out with the field force for two months, and is now under orders to hold himself in readiness for further active service; in consequence he is unable to be here. During his absence on duty, I had personally considerable work with the business of the Natal Agricultural Union, of which he is also secretary, and of which I was president, and I have been unable therefore, under the circumstances to devote as much time and attention as I would have liked to the affairs of the Union. The South African Stud-book has now been launched, and I believe it will prove of great benefit to the advancement of agriculture. It is a matter of very great regret to me that Natal has not yet joined with the other States and Colonies in this, but I know that it is not through any lack of interest or desire on the part of the agricultural community, but it is through the action of members of the Legislative Assembly who are supposed to represent farming constituencies, who refused to grant the amount which it was fixed Natal should contribute, and supported the deletion of the vote from the estimates. However, I hope ere long that Natal will join with the other States in the Stud-book, and I think you may count on Natal agriculturists agitating on the question until the necessary amount is granted. (Applause).

Mr. Nicholson (Transvaal) moved the adoption of the address, and that it be printed in the minutes of the proceedings.

Mr. Lee (Cape Colony) seconded, and said he thought it was one of those addresses that should be handed down from Congress to Congress to shew that an organisation of this kind was absolutely necessary.

Mr. Van der Merwe (Transvaal) did not intend to move an amendment, but he wished to ask the president to delete the words "as far as possible" when referring to politics.

Mr. Lee presumed the president referred to party politics, but they must have agricultural politics.

The President said he did not intend politics to be discussed, but, at every Union meeting politics would arise.

The address was adopted.

Letters of apology for non-attendance and inability to send delegates were received from the Rhodesia and Orange River Colony Agricultural Unions.

PRESENTATION TO MR. T. J. NICHOLSON.

Before proceeding with the business proper, the President said he wished to make a small presentation to Mr. Nicholson who as hon. secretary of the Inter-colonial Union, when it was first started, did an immense amount of work to further it. At that time the Inter-Colonial Union was desirous of recognising his work, but owing to the want of funds was unable to do so. However, he now wished to hand to Mr. Nicholson, as a mark of appreciation, a gold watch and chain, with the hope that he may live many years to wear it. (Applause).

Mr. Nicholson, in reply, said the many kindly words and the present accompanying them were a great surprise. It had been one of the joys of his life to go from Colony to Colony to see the farmers and the conditions under which they laboured. The watch came at a most opportune time, as he had in his pocket a watch presented to him 25 years ago in the Transvaal, and which had just gone wrong. (Loud laughter). He concluded by again returning his heartiest thanks.

The Congress then proceeded to consider the rules of the Inter-Colonial Agricultural Union, which during the morning had been revised by the executive.

On the question of the representation of the different Colonies, the executive recommended that each State send five delegates.

After some discussion, it was decided to postpone the subject until the end of the proceedings, to ascertain how the regulations at present in force acted.

The rules were then adopted with the exception of Nos. 9 and 24 which were held over. The hours of sitting having been decided upon, the minutes of the last meeting were unanimously adopted.

The agenda was proceeded with. The Acting Secretary (Mr. F. D. MacDermott) read the replies of the different Governments to resolutions passed at the first Annual Congress held at Pietermaritzburg last year.

CONTAGIOUS DISEASES AMONG STOCK.

The first item on the Agenda was a resolution passed at the last Conference which read as follows:—

“That this Conference deems it advisable that combined action should be taken by the various Governments of South Africa with regard to infectious and contagious diseases among stock.”

Natal Government's reply: Combined action is already, as far as possible, being taken by the various Governments. The

Veterinary Departments of the Orange River Colony, Transvaal and Natal are acting in concert as regards the method of dealing with stock of all descriptions travelling from one Colony to another.

Other Governments : No reply.

Mr. Robertson (Transvaal), referring to the resolution, said that what was wanted was the trusting of one Colony by the other. He knew that there was considerable difficulty in the transit of sheep and goats from the Transvaal to the Cape. The animals were first dipped on the borders of the Transvaal, and then on the border of the Orange River Colony, and also on the Cape border before being admitted into this Colony. He considered that combined action should be taken by the various Governments.

Mr. Douglass moved that the following be added as a rider to the resolution : "That the different Governments take into consideration the enormous importance of cleaning cattle of ticks before entrance into the various Colonies, as this is one of the main causes for spreading disease."

Mr. Evans seconded.

The President said that it was necessary to educate the Governments up to the value and influence of the Agricultural Unions.

The discussion on this resolution was adjourned till the afternoon.

INTER-COLONIAL SCAB ACT.

The next subject discussed was the necessity for a Scab Act. At the last meeting of the Union the following resolution was adopted : "This Conference deems it desirable that a uniformly stringent Scab Act be enforced in each of the British colonies of South Africa." Natal Government's reply was : "The Scab Law at present in force in Natal appears to be working well and to have worked well in the past. An amending Act, designed to strengthen the hands of the Natal Veterinary Department, will be submitted at the next session of Parliament." Other Governments : No reply.

Mr. Lee moved as an amendment : "That this Conference is of opinion that a uniform Scab Act is desirable, but the local conditions in each colony make it a very difficult matter to arrange for such uniformity, and this Conference refers this question of a uniform Scab Act to the Standing Committee appointed to deal with Stock Diseases."

The amendment was seconded by Mr. Michau, and adopted.

HIS EXCELLENCY THE GOVERNOR.

At noon His Excellency the Governor (Sir Walter Hely-Hutchinson) and the Mayor of Cape Town (Mr. H. Liberman) attended the Conference, to extend a welcome to the delegates.

His Excellency was received by the President (Mr. Alexander) who thanked him for sparing some of his very valuable time to attend that gathering, but it proved the great interest he evinced in farmers and farming. (Applause.)

His Excellency, who was received with loud applause, said ; "Gentlemen,—It has given me a great deal of pleasure to be present here to-day, to say a few words of welcome to the members of the Agricultural Union. I see amongst you many whom I have met on their own farms, and you all know what a great interest I take in the progress and prosperity of the pastoral and agricultural interests of South Africa. (Applause.) I am glad to think that you have gathered here to-day to consult on what can best be done to forward the agricultural and pastoral interests of the country, because I do believe that in consultation, and in unity of effort their success lies. I may say whilst on the subject of unity, that I am glad to hear that negotiations have been in progress between the Agricultural Union and the Farmers' Association, with the object of arriving at one central organisation, in which shall be united all the best opinion and the best advice of the farming people of South Africa. (Loud applause.) I do not suppose that you desire, and it is certainly not my desire, to deal at any length with the farming and pastoral questions of the country. I might talk to you of co-operation. (Hear, hear.) Well, that is a subject we have often discussed, and I think this meeting is evidence of co-operation. I might also talk to you of the burning question of ticks—(laughter)—or I might talk to you of the improvements in the scab law, or the study of the question of wool sorting, which, I believe, has a very serious bearing on the pastoral interests of the country, or I might talk to you of fruit-packing or the dream of experimental stations throughout the country, but those are all questions which you are much more fitted to discuss than I am. I know your minds are open and awake to them, and, looking back over the past ten or twelve years, I see a great and vast improvement in all these questions which affect your prosperity. In these days of industrial struggle for pre-eminence it is felt that scientific and ordered effort has to be presented to the consultation of all questions that present themselves in farming, just as much as in other pursuits. That is the existing state of affairs throughout the world, in Canada, in Australia, in New Zealand, in India, and in the West Indies. Whilst on the subject of the West Indies, I may say I have recently been perusing a very interesting blue book—now, as a rule, blue books are not interesting, but this is one is exceptionally so. It is an account of the work that has been done

in the West Indies during the past eight years by the Imperial Department of Agriculture. I am so much interested in the record of the work done that I have decided to present this book to your President, in the hope that he will study it and communicate such parts to you as may be of interest to you. The establishment of this Imperial Department of Agriculture was one of the first principles of the scientific attacking of problems of agriculture, and although in the West Indies the plants they cultivate and the fruits they grow are different to what you do here, still there is a great deal to be learned from the methods they have adopted. They have overcome great difficulties and effected great improvements by united effort, and scientific treatment of the problems that presented themselves. One point which particularly interested me in that book was the account of the efforts made to teach in the principal schools and colleges the problems of agriculture. This, of course, does not refer to colleges like Elsenburg, but the object of the Imperial Department of Agriculture appears to have been to give every lad who goes to school an opportunity of learning something about the principles of agriculture. Some of them, perhaps, learn very little, but the others learn a great deal, and that in the higher branches, and even Mr. Lounsbury or Dr. Hutcheon would recognise that the scientific principles had been realised. In the West Indies it has been considered necessary for many years past to provide technical education on all sorts of subjects for young people, and only lately it was discovered that in that country which is almost purely agricultural, that every technical education had been provided for, except agricultural education. If I were to give you a detailed account of how agriculture has grown in that country I would keep you here for a very long time, and I do not intend to do that, but there is an account in that book of the attempts that have been made in the primary schools in the island of Trinidad to teach agriculture. There is a description there of how, in an ordinary primary school with 400 square yards of land they are able to convey to the children some really useful ideas of agriculture—not only in the matter of gardening or of cultivating or pruning trees, or grafting, but also in some practical experimental work; for instance, they will have small plots—say, three of an equal size and the same product will be grown in each plot. Take sugar cane as an example. In one plot they will merely plant the cane; in the next they will fork the plot and put in a similar quantity of cane, and the third they will fork and manure and plant the cane. The children do it all. When it has grown it is cut and weighed, and the child finds that in the untouched plot there are 24 lbs. of cane, in the forked plot there are 84 lbs. of cane, and in the forked and manured plot there are 124 lbs. of cane. In that way the children are taught the value of preparing the ground. This is out-door work and therefore supplements the oral instruction given in the schools. That is one of the many points in con-

nection with the improvement of agriculture which are referred to in this book." In conclusion, His Excellency said: "I must say it gives me particular pleasure to think that there are present here gentlemen from the Transvaal, Natal, and Orange River Colony. It seems to me to be the first step in the federation of agricultural and pastoral interests in South Africa. I hope the results of your discussions will be of great utility, and in any case I wish you all success in your undertakings, and a continuance of the favourable weather, which I am glad to see reflected in your smiling faces, and which I am glad to think has done so much good throughout South Africa in these later days. (Applause.)

The President, in thanking His Excellency for his kindness in attending the conference, also thanked him for his words of welcome. To those delegates from Natal His Excellency was no stranger, as they all remembered his sojourn there and the great interest he took in matters which affected that State. The words of the old Scotch song, "Will ye no come back again?" were very applicable to the feelings of the people in Natal with regard to His Excellency. He trusted that His Excellency would yet pay a visit to Natal, and he would see the rapid strides that Colony had made in its agricultural and pastoral pursuits. The interest His Excellency always evinced in farming was well known, and he (the President) believed nature originally intended him to be a farmer. (Laughter.) He wished, before concluding, to say that the Union had done a great deal to further agriculture in South Africa, and His Excellency would understand the interest in it when he learned that many of the delegates had travelled many hundred miles at their own expense, and many had left their homes in Natal when times were very critical, in order to be present at the deliberations of the Union. (Applause.)

The Mayor (Mr. H. Libermann) on behalf of the citizens of Cape Town, extended a hearty welcome to the delegates. He said that in Cape Town they were doing their best to encourage the farmers—the farmers had the sympathy of the people, because the general opinion was that agriculture was the main industry of the country. It was often said that the farmers were the backbone of the country, but the townspeople were the rest of the body. (Laughter.) Some people seemed to think that farmers lacked intelligence, but he formed a different opinion, in fact, when he was in business he often received very sound advice from farmers. He was glad to see the great strides agriculture was making, and he believed that with the sympathy of the public and the Government, South Africa would very soon be able to compete with other countries. He was glad to see that Government had imposed a duty of 1d. per lb. on imported meat. He was sorry it was not more, because of what he had read in the newspapers of the tinned meat manufactured in America. Touching on the wool question, His Worship said he would like to see a few farmers from South

Africa visiting the big wool-growing countries, and seeing the way in which the business was conducted. Regarding a market for perishable goods, His Worship considered there was a very good market in Cape Colony, and he impressed on the farmers that they were not going to make a fortune out of exporting. He believed it was the duty of the Government to send a body of farmers to Europe every year to see how the different countries placed their products on the market. In the commercial world it was necessary for purchasers to go to Europe, and, therefore, it was necessary for the farmers to go and see how articles were placed on the market. He concluded by according a hearty welcome to the delegates, and trusting that their deliberations would be effectual in furthering South Africa. (Applause).

Mr. C. G. Lee (President of the Cape Colony Agricultural Union) replied and thanked His Excellency and the Mayor for their kindly receptions. He said the gathering round the table shewed a fine spirit of patriotism.

The Director of Agriculture (Dr. Hutcheon) apologised on behalf of the Minister for Agriculture (the Hon. Mr. Fuller) for his inability to attend. He had intended doing so, but at the last moment was summoned to a cabinet meeting. He regretted not being able to meet the farmers.

Mr. Lee replied on behalf of the Cape Colony Agricultural Union, and at one o'clock the Conference adjourned to luncheon.

AFTERNOON SITTING.

In the afternoon the delegates, at the invitation of the Mayor of Cape Town, made the round tour to Camp's Bay, where they were entertained by His Worship, after which they were shown over the Electric Power Station. On their return to the city they resumed the business of the Conference.

CONTAGIOUS DISEASES AMONGST STOCK.

Discussion on this subject was resumed.

Mr. Malan (Transvaal) said he would accept the resolution passed at the last Congress if he were allowed to move a rider to follow the standing resolution as follows: "And to get their regulations as uniform as possible."

The Director of Agriculture (Dr. Hutcheon) said there was a unanimous desire to bring the regulations into uniformity, but there was one difficulty that confronted them all, and that was the Scab Act. He thought it was best to try and administer the Act as it at present stood, than to have any amended regulations. He thought the meeting would recognise the difficulty. There was to be an amendment introduced, during the present session of the Cape Parliament, to the Animals Diseases Act, covering lung sickness,

glanders, tuberculosis, etc. Lung sickness was one of the easiest diseases dealt with, as the infection did not remain long. Under the proposed amendments, power was to be conferred on the Veterinary Department to kill all infected animals, and to give reasonable compensation. With regard to the native cattle it was also suggested that the animals suffering from lung sickness should be killed, and compensation given, and the natives allowed to eat the carcasses. Regarding tuberculosis, Dr. Hutcheon said there was more of this disease in the colony than people believed. At the present time regulations were being sought to test cattle to ascertain if they were suffering from tuberculosis. Under the Act they were trying to make the regulations as uniform as possible, but they had to restrict the introduction of cattle from Rhodesia and the Transvaal; however, the regulations regarding small stock and horses were somewhat restricted.

Mr. Evans inquired if there was any possibility of tracing tuberculosis in cattle. It was a very serious thing to hear that the disease was prevalent, especially now that there were so many creameries being started in the country.

Dr. Hutcheon replied that at the present stage he did not wish to say too much, but the presence of the disease could be suspected in cattle from their unthrifty appearance; frequently coupled with a cough. Tuberculosis had been actually found in several herds, where it was not expected.

Mr. Lee said the matter was so very important that he did not think the resolution proposed was sufficient. He would like to move the following resolution: "That this Conference, recognising that it is highly important that combined action should be taken in connection with contagious diseases, reaffirms the previous resolutions asking for action; and, further, refers this question to the Standing Committee to be appointed to deal with Stock Diseases, with the recommendation that the various Governments be asked to make the regulations uniform, as far as possible."

Seconded by Mr. Scott.

Mr. Nicholson mentioned that a short while ago a shipment of Madagascar cattle was landed in the Transvaal. On being subjected to the ordinary test, it was found that 47 out of the herd of 60 cattle were suffering from tuberculosis, although the cattle left Madagascar with a clean bill of health.

Mr. Lee's resolution was unanimously adopted.

SOUTH AFRICAN LABORATORY.

The following resolution, adopted at the last Congress, was next discussed: "That this Conference considers it desirable that steps should be taken to establish a Central South African laboratory for scientific research and for investigation of diseases among live-stock, in addition to local laboratories."

Natal Government's Reply: Having regard to the cost of our local laboratory which could not be dispensed with in favour of a Central Institution, the Government is not prepared at the present time to incur further expenditure in this direction. Other Governments: No reply.

Mr. Malan (Transvaal) moved the adoption of the resolution.

Mr. Malleson moved, as an amendment: "That this Conference urge on the Governments of the various Colonies the need for establishing a Central Laboratory for the investigation of Animal and Plant Diseases, in addition to the local laboratories." There were many diseases prevalent in fruit in Cape Colony which were not hitherto known, and it was necessary to deal with them and elucidate them.

Mr. Nicholson seconded.

Dr. Hutcheon supported the resolution, as amended.

The amended resolution was carried.

THE REGISTRATION OF BRANDS.

The question of an Inter-Colonial Branding Act was next discussed. At the last Congress, the following resolution was adopted: "That this Conference confirms the principle of an Inter-Colonial Live-stock Marking Act."

Natal Government's reply: "The impracticability of carrying out such an Act, especially in Native Locations where there is a constant passing of cattle from hand to hand in connection with lobola, etc., appears to make legislation on compulsory lines inadvisable." Other Governments: No reply.

Mr. Scott thought it would be advisable to make the branding of cattle and the registration of brands compulsory. He moved that the resolution be re-affirmed.

Mr. Van der Merwe seconded.

Mr. Lee said that as far as the Cape was concerned, it would be impracticable to enforce a Compulsory Branding Act. He hoped the day was not far off when it could be enforced, but, notwithstanding that, he would support Mr. Scott's motion.

Mr. Hancock moved as an addition the words: "With provision for the gradual introduction throughout South Africa of the method of branding known as the three-piece system."

This was agreed to.

OCEAN FREIGHTS ON MACHINERY.

It was unanimously agreed to re-affirm the following resolution: "That this Congress urges upon the Government the necessity for a reduction in ocean freights on machinery and agricultural implements."

OCEAN AND RAILWAY RATES ON IMPORTED LIVE-STOCK.

The Congress next proceeded to consider the following resolution passed at the last Conference: "That this Congress is of opinion that there should be a reduction in the ocean freights and railway rates on stock imported suitable for breeding purposes, provided that such stock is eligible for entry in the South African Stud Book."

Mr. Nicholson moved: "That this Conference is of opinion that still further reductions should be made on ocean freights and railway rates on stock imported and suitable for breeding purposes, provided that such stock be eligible for entry in the South African Stud Book, the reduction which has so far been made not being of such a nature as to satisfy the farming community."

This motion was agreed to.

The Congress then adjourned for dinner.

EVENING SITTING.

The Congress resumed its sittings at 8 o'clock.

STANDARD WEIGHTS AND MEASURES.

Mr. Nicholson introduced the subject and moved the following resolution: "That this Conference is of opinion that it is desirable to establish standard weights and measures throughout South Africa, and that all produce be sold by such standards, and that produce be sold by 100 lbs., inclusive of packages." He mentioned that the Transvaal Government had gone into the matter, and an Act dealing with the subject was in preparation.

Mr. Malleon said he would support the resolution if it was made to read "exclusive of packages."

Mr. Hancock moved as an amendment that the executive Committee be instructed to draw up a scale of weights and measures for produce. That these weights be referred to the various Governments in South Africa, with the request that they be given effect to by legislative enactments. It being an instruction to the Committee to work upon a basis of per 100 lbs.; the ton to be 2,000 lbs.; packages to be excluded.

Mr. Van der Merwe seconded, and the amendment was adopted.

DUTIES ON IMPORTED MEAT.

At the last Congress the following resolution was adopted: "That this Union is of opinion that each Colony should deal with the meat duties as is most suitable for the local circumstances, but suggests that, where practicable, public abattoirs and cold storage should be established at various large centres, and that an

additional licence be imposed on all butchers selling imported meat, but that no licence be charged on the sale of Colonial meat."

Mr. C. G. Lee (Cape Colony) moved as an amendment: "That this Union is of opinion that, where practicable, public abattoirs should be established in stock-raising centres, and cold storage accommodation in connection with the same at the consuming centres."

Mr. Van der Merwe seconded.

Mr. Nicholson moved the adoption of the resolution as it stood on the agenda.

Mr. Lee expressed the opinion that the matter would not be settled until the farmers took it up. He considered that in sending live-stock for slaughter purposes to the cities, the farmer had to pay freightage on a large quantity of offal, when he could, if he had an abattoir at hand, clean and send down to the markets at half the rates.

After some further discussion, Mr. Lee agreed to withdraw his amendment, if Mr. Nicholson would consent to the following rider being added to the original resolution: "That it be a recommendation from this Conference to the various Governments to encourage private enterprise in the establishment of abattoirs and cold storage by a system of bonuses graduated according to the magnitude of the operations."

Mr. Nicholson accepted Mr. Lee's rider.

The original resolution, as amended, was then adopted.

RAILWAY RATES FOR COLONIAL PRODUCE.

The following resolution, carried at the last Conference was unanimously re-affirmed. "That this Conference is of opinion that it is desirable to obtain a uniform rate for Colonial Produce over the various South African Railway systems."

Natal Government's Reply: Owing to the difference in the cost of working the different railway systems it is not possible, without losing revenue, for the Administrations where the cost is high, to reduce the rate to what may be a payable rate over a line more favourably situated. The Natal Government is, however, of opinion that the rate fixed for the carriage of Colonial produce in any Colony should be available for the conveyance of produce grown in any other South African Colony. Cape Government's Reply from General Manager of Railways: In connection with the opinion of the Conference that a uniform rate for Colonial Produce should be charged over the various South African Railway Systems, the opinion is noted. As the Congress is, no doubt, aware, agricultural produce is conveyed over the Cape Government Railways at extremely low rates. Other Governments: No reply.

PESTS OF FRUIT TREES.

Mr. Malleeson drew the attention of the Conference to the great havoc caused by pests on fruit trees, and moved that the following resolution passed at last Conference, be re-affirmed and kept before the various Governments: "That the Government be approached with a view of introducing legislation to compel the owners of fruit-trees, other than vines, to take proper measures to keep them free from insects and other infectious pests, and that a suitable penalty be fixed for the violations thereof."

Natal Government's reply:—In the opinion of this Government the Plants' Diseases Act (Act No. 45, 1904) sufficiently provides for dealing with growers of fruit trees. The other Colonies of South Africa are endeavouring to cope with all insect and other pests. Cape Government's Reply: An Act is in force in this Colony for the control of insect pests in nurseries, and that the question of eradicating insect pests and diseases from orchards in general is receiving consideration. Other Governments: No replies.

Mr. Le Sueur moved that vines should be included and not excluded and the resolution was carried in this form.

CRUDE PETROLEUM FOR FUEL.

Mr. Evans introduced this subject, and moved the re-affirmation of the resolution carried at the last conference: "Taking into consideration the large quantities of paraffine burned in the Colony as fuel for engines used for irrigation purposes, Government be respectfully requested to make inquiries and procure information with regard to the importation of crude oil in bulk, with a view to ascertaining whether it could, by this means and the exercise of consideration with regard to import duties, be supplied more cheaply to farmers than the oil at present in use."

Natal Government's Reply: The Agent-General has addressed enquiries to the two largest exporters of American and Russian Oil. The American Company has replied stating that the enquiry will be dealt with by their Cape House.

The Asiatic Petroleum Co., Ltd., quotes for crude Petroleum in bulk and states that the most economical method of delivering liquid fuel at Durban would be by means of a Bulk Oil Steamer carrying a cargo of from 3,500 to 4,000 tons of fuel. The C.I.F. cost would be 48s. per ton. If a contract was entered into the price would be a shade lower.

The oil would have to be stored in properly constructed tanks at the Port and packed in drums or casks as required for despatch.

The Agent-General is obtaining estimates of suitable storage tanks.

Cape Government's Reply from Department of Agriculture: This matter falls under the administration of the Public Works Department; the resolution in question has been communicated to the Secretary for Public Works for his consideration and for such action as may be deemed advisable.

Other Governments: No reply.

The Chairman said he would like to draw the attention of those members of the Conference who used oil engines that there is a much more economical power than these oil engines—he referred to gas engines with modern gas-producing plants. They were being gone in for on a large scale in Natal, and were being worked at a cost of 1d. for each horse-power per hour. It was a plant that was superseding everything, except water power, where there was a direct lead. The machinery also cost much less than that used with oil engines.

Mr. Ryan said he was glad to hear that these engines were satisfactory in Natal. He saw one at the Rosebank Show in March last, and it could not be got to work. (Laughter.)

The Chairman drew Mr. Ryan's attention to the fact that there were good and bad engines in gas, just as in petroleum.

Mr. Evans asked that the matter be allowed to stand over for the present.

This was agreed to.

NATIVE LABOUR SUPPLY.

On the motion of Mr. Hancock (Natal) a resolution favouring uniformity of action with regard to native labour was dropped.

CO-OPERATION IN AGRICULTURE.

The following resolution, adopted at the last Conference was next considered: "That the Executive Committee be instructed to consider the question of co-operation between agriculturists and stock farmers with a view to bringing the consumer and producer into closer touch."

Mr. Nicholson referred to the steps that had been taken in the Transvaal.

Mr. Lee also testified to the advance co-operation had made in Cape Colony since the last Congress was held.

Mr. Ryan thought the words "between agriculturists and stock farmers" should be deleted. The idea was to bring the producer and consumer into closer touch than they were at present. He moved the following amendment: "That the Executive Committee be instructed to consider the question of co-operation with a view to bringing the consumer and producer together, and that the different Governments be requested to subsidise, where advisable, co-operative societies amongst farmers working directly to bring their produce into the market,"

Mr. Hancock opposed going to the Governments for any more money, but on a vote being taken the resolution as amended was carried.

LABELLING FROZEN MEAT.

A discussion arose on the resolutions carried at the last Conference as follows:

"That sellers of Imported Frozen Meat be compelled to label it as such." Natal Government's reply: It is proposed to introduce legislation on this subject. Cape Government's Reply from Department of Agriculture: A Law is already in force in this Colony compelling sellers of imported frozen meat to label that article as such. Other Governments: No reply.

Mr. Van der Merwe moved, seconded by Mr. Malan: "That the Transvaal Government be requested to fall into line with the Cape and Natal Governments by compelling the sellers of Imported Frozen Meat to label it as such."

Carried.

The Congress adjourned at 10 p.m. till Tuesday morning.

To be Continued.

CRACKED PIPES UNDER DAMS.

By R. W. NEWMAN, Assistant Engineer, Irrigation Department.

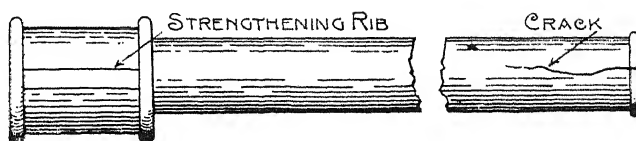
When inspecting an irrigation work in January last I noticed several cast iron pipes intended for use in the work, of which about 33 per cent. were split at the spigot end; this being accounted for by the exceptionally rough road over which they were transported from the station.

Since that time I have taken every opportunity to examine pipes lying at farms, sidings, etc., and have nearly always found that some are split in this manner.

Last week I examined some pipes which were just about to be put into a dam and as usual found one cracked.

As I have found it difficult to find cracks even when specially looking for them, they must often be overlooked by farmers; in discussing the matter with farmers, I find many of them look upon such cracks as of no consequence, stating that when they are socketed they will be all right. The danger of such a view cannot be too strongly impressed upon them.

I find that the majority of pipes are bought for dam outlets, and that it is the practice to order only the *net* length, with the result that the broken pipes may often be put in; further, owing to the practice of putting valves on the outlet side of the dam, if leakage takes place through these cracks, it is not stopped when the valve is closed and is constantly proceeding under the dam.



The class of pipe to which I refer is shewn in sketch and may be described as a heavy rain-water pipe; the socket is light and has a strengthening rib on two sides; the best class of English pipe is practically never used, *i.e.* with a heavy socket and a spigot protected by a temporary W.I. ring.

The crack varies from $\frac{1}{2}$ inch long to (say) 6 inches and by striking the pipe sharply with a hammer will often extend further, shewing that the metal is in a state of tension, probably due to sudden contraction by cooling when withdrawn from the mould.

The use of steel pipes with sockets would do away with this risk, or the English pattern of pipe, which is much heavier and has probably been annealed for dipping and is fitted with a temporary W.I. Ring, would be safer; but the cost of transport is greater on the latter pipe, and when comparing the cost per lineal foot, steel pipes are ignored on account of their extra cost.

Pipes put off at sidings, when no unloading platforms exist and when no staff is kept, are specially liable to injuries of this nature owing to careless handling.

Wrought Iron screwed tubes are not satisfactory under dams, owing to the treatment of the material while under construction. They are more liable to be affected by moist earth and rust readily, soon splitting. The only way that a pipe can be made absolutely secure under a bank for all time is to surround it with concrete.

EXPERIMENTAL CROPS IN CAPE COLONY.

An "Ad Interim" Report by Dr. Eric A. Nobbs,
Agricultural Assistant.

For some time past the Agricultural Department has been actively engaged in distributing new sorts of seed to farmers all over the Colony, with a view to increasing, if possible, the number of crops in cultivation, and of ascertaining the best varieties to grow as well as the most suitable modes of culture to adopt.

A lively response has been made by the farmers to offers of parcels of seed for trial gratis, subject to a report being given of the results. The reports are now being received from all quarters, though too many applicants for seed fail to realise their responsibility in this way, or to appreciate that it is only through the accumulation of such returns that any true idea of the suitability of these crops can be arrived at. It is not to be expected that success will everywhere result, and it is of the first importance that the causes of failure or the limits of a suitable area should be ascertained as readily and exactly as may be.

Sincere thanks are due to those who have sent in reports, which are now published, not as final pronouncements, but merely as progress reports, so that the information obtained may, as speedily as possible, become public property.

The value of rape is rapidly coming to be appreciated, and the plant bids fair soon to become a standard fodder crop for ostriches, sheep and dairy cattle. Apparently all three varieties (Essex, winter and summer rape) do equally well, though further trial may indicate special advantages of one or other in different places. In some parts this plant has come to be regarded as one of the ordinary crops, and quite indispensable. It certainly deserves to be more widely grown than is at present the case, and, doubtless, this will be the case, once its advantages are better known. A word of warning is necessary to those using rape for dairy cows. It is apt to taint both milk and butter, unless the precaution is taken of feeding the stock on it only for an hour or so immediately after milking, and then taking them to other pasturage.

The Department has distributed seed lately to some hundred-and-thirty farmers, and the reports received to date, published below, speak for themselves.

WINTER RAPE.

This variety is sown in autumn in Europe, where it is considered more slow-growing than the others. With us it may be sown in March and April, and again about August broadcast, on "bracked" lands, at the rate of 12 to 16 lbs. of seed per morgen. A light harrowing to cover the seed is all the cultivation necessary. It is well to sow at intervals so as to obtain a succession of green food. If under irrigation, sow in drills, 18 to 24 inches apart, using 8 to 10 lbs. seed per morgen. Kraal or artificial manures help the growth, but are not essential.

The following are the reports :—

King William's Town (Mr. W. E. Heyns). Sown early in March. Result: Good. Good for cows and pigs, especially if blight could be destroyed.

Knysna (Mr. G. van Huysten). Sown 29th June, 1905. Result: Good. Went to seed when about one foot high. It will pay, and is suitable to district.

East London (Mr. R. N. Marillier). Sown 15th April, 1905. Result: Good. 35-40 tons per acre from 8 lbs. seed, reaped and fed to cattle.

Cradock (Mr. C. E. Lawford). Sown 21st April, 1905. Result: Bad. Lice destroy it too rapidly, and it requires too much water.

Piquetberg (Mr. E. Conz). Sown 25th April, 1905. Result: Good. A very good crop for sheep; should be sown as early as possible.

Paarl (Mr. J. A. Louw). Sown 24th June, 1905. Result: Good. Good for sheep, grows well, is suitable, and will pay in this district. Should be sown in April or May.

Cathcart (Mr. W. H. Torr). Sown 6th March, 1905. Result: Good. Will pay, and is suitable for district; should be sown in February for winter feeding.

Molteno (Mr. A. Francis). Sown 23rd September, 1905. Result: Negative. Destroyed by hail.

Tarkastad (Mr. H. Thackwray). Sown in March. Result: Good. The rape is doing well so far.

Upper Albany (Mr. Charles White). Sown April, 1905. Result: Good. Grazed by ostriches; it is both suitable, and will pay in this part.

SUMMER RAPE.

The same instructions for sowing hold good, though it should preferably be sown from August to October.

The following reports have been received :—

King William's Town (Mr. W. E. Heyns). Sown 27th September, 1905. Result: Good. It will pay, and is suitable to district.

King William's Town (Mr. E. C. Fletcher). Sown 25th April, 1905. Result: Good. Grew splendidly, only stock did not seem to care for it.

Knysna (Mr. G. van Huysten). Sown 29th June, 1905. Result: Good. Went to seed when about one foot high; it will pay and is suitable for this district.

East London (Mr. R. N. Marillier). Sown 20th September, Result: Indifferent. This rape did not do as well as winter rape. Seeded two months after sowing.

Piquetberg (Mr. E. Conz). Sown 23rd June, 1905. Result: Good. Should have been sown earlier; is suitable, and will pay in this district.

Paarl (Mr. J. A. Louw). Sown 1st September, 1905. Result: Good. Good for sheep, grows well; is suitable, and will pay in this district; but should be sown in April.

Paarl (Mr. J. H. Buxman). Sown 13th July, 1905. Result: Fair. Did not resist drought and insect pests as well as winter rape.

Caledon (Mr. J. J. de Villiers). Sown 3rd May, 1905. Result: Fair. Went to seed, and did not make as good a growth as Essex rape.

Beaufort West (Mr. Paul Nel). Sown 2nd October, 1905. Result: Very good. Growing luxuriantly; highly suitable to this part, and will pay. Stock eat greedily; untouched by frost.

East Griqualand (Mr. A. W. Sephton). Sown 12th November. Result: Negative. Destroyed by hail.

Molteno (Mr. A. Francis). Sown 23rd September. Result: Negative. Destroyed by hail; should be sown early for winter feeding for stock.

Upper Albany (Mr. T. C. White). Sown April. Result: Good. Grazed by ostriches; it is suitable, and will pay in this district.

ESSEX RAPE.

The treatment is as before, and the following reports are to hand; from observations made, it may be mentioned that this form has shown itself somewhat susceptible to frosts:—

King William's Town (Mr. E. C. Fletcher). Sown 6th March, 1905. Result: Good. Grew splendidly; only stock did not seem to care for it at all.

Knysna (Mr. G. van Huysten). Sown 29th June, 1905. Result: Good. Went to seed when about one foot high; it will pay, and is suitable to district.

East London (Mr. R. N. Marillier). Sown 17th April, 1905. Result: Good. 40 to 45 tons per acre from 4 lbs. of seed; reaped and fed to cattle.

Albany (Mr. T. T. Hoole). Sown March, 1905. Good. Splendid for ostriches and sheep; should not be sown more than 6 lbs. to the acre.

Alexandria (Mr. John Daverin). Sown 20th July, 1905. Result: Good. Consider it suitable for district, but is troubled by moths which destroy leaves.

Paarl (Mr. J. W. Mason). Sown 5th May, 1905. Result: Negative. Seed failed to germinate.

Paarl (Mr. J. H. Buxman). Sown 13th July, 1905. Result: Fair. Did not resist drought and insect pests as well as Winter Rape.

Caledon (Mr. J. J. de Villiers). Sown 3rd May, 1905. Result: Fair. Should be sown as a catch crop early in winter.

Cathcart (Mr. W. H. Torr). Sown August, 1905. Result: Good. A quicker grower, hardier and more drought-resistant than other Rapes.

East Griqualand (Mr. D. B. Menne). Sown January, 1905. Result: Fair. Did very well, grazed by sheep in April, other sown just before winter: killed by frost.

Stellenbosch (Mr. O. M. Barry). Sown 3rd May, 1905. Result: Indifferent. Sown thus early in winter, only a small quantity of seed germinated.

Upper Albany (Mr. T. C. White). Sown April. Result: Good. Grazed by ostriches; it is suitable and will pay in this district.

Stellenbosch (Mr. W. L. Steel). Sown 10th May, 1905. Result: Very good. A very heavy crop 2 feet high, reaped and fed to dairy cattle. Highly suitable to this part and will certainly pay.

THOUSAND-HEADED KALE.

is recommended for trial to those who require a succulent green feed for dairy cattle either to be fed fresh or made into ensilage. It grows to a height of 3 feet or more and branching close to the ground gives a heavy crop of juicy green leaves. It withstands cold well but is not suited to our drier regions. In the Western Province without irrigation April and August are the sowing months, preferably the former, while under irrigation August and September should be about right. It is best sown in drills 36 to 30 inches wide using 12 lbs. of seed per morgen or it may be treated like cabbages and planted out 30 inches apart which takes 15,000 plants per morgen. With stable or kraal manure or under irrigation Kale yields very heavy returns and three crops may be gathered from it in one season.

The reports so far received are not over sanguine but splendid crops of Kale were seen growing on several farms in the Western Province last year, and further trial is certainly justified.

Mafeking (Mr. H. D. Roberts). Sown August. Result: Good. An excellent crop for cattle in winter.

Malmesbury (Mr. M. Melck). Result: Indifferent. Not nearly as good as Rape, soon affected by summer heat.

Clanwilliam (Mr. W. McGregor). Sown 5th April, 1905. Result: Indifferent. Not suitable, young plants could not stand heat.

Alexandria (Mr. John Daverin). Sown 20th June, 1905. Result: Good. I consider crop suitable; did well but burned up in dry weather.

Stellenbosch (Mr. O. M. Barry). Sown 20th June, 18th August. Result: Good. A most valuable crop for cattle; very suitable to District but I think seed should be sown early in April and planted out 3 feet square.

MANGOLD.

In many parts of the Colony this crop is too well-known to require to be sown experimentally yet its cultivation might certainly be extended with advantage as the following few reports from very widely separated areas shew. It is sown in the Western Province in beds in March, April and May, and planted out in June, July and August. In its native home in Europe it is sown direct on ridges 28 to 30 inches apart and the same may be done here also using from 12 to 14 pounds of seed per morgen.

Mangold is adapted to heavy soils and keeps well when stored in a cool dry place.

Somerset East (Mr. R. H. A. Bowker). Sown 4th October. Result: Good. Crop will pay and is very suitable for winter feeding; stands drought well.

King William's Town (E. C. Fletcher). Sown 17th June, 1905. Result: Good. Suitable for district, and for stock feeding; about two ton so far suffered from drought.

King William's Town (Mr. W. E. Heyns). Result: Good. Suitable to district, and pays well as a winter feed; must be sown early in spring to escape insects.

Barkly East (Mr. A. W. T. Brigg). Sown 15th December, 1905. Result: Good. Should be sown in November. Turnips and mangolds pay here.

Stellenbosch (A. Kennedy). Sown March, planted June, 1905. Result: Very Good. Averaged 7 lbs. each; yield, 38 tons per acre. Cows and pigs do well on mangolds; resist drought; suitable to district.

Stellenbosch (Alex. Robertson). Result: Good. Have never weighed a root, but should say biggest will run to 25 lbs. This on brak land.

SUGAR BEET.

Only a few reports are as yet to hand. It will be interesting to obtain a more general consensus of opinion as this plant holds out possibilities as an industrial crop for sugar production as well as a fodder.

Molteno (A. Francis). Result: Indifferent. Badly damaged by insects and locusts; sowing again. Sown 12th January. Result: Good. A very good fodder for cows and sheep, will do well in a better season, and it will pay well as a winter fodder.

Knysna (Mrs. Duthie). Sown 17th August, 17th September, 29th October. Result: Fair. If sown early in March and weather is damp it grows quickly and gives a good crop. Good for horses, fed every other day; cannot stand drought.

Durbanville (Forester Fox). Sown 15th August. Result: Indifferent. Will not do on the white sand we have here. Yield, 1,000 lbs.

BUCKWHEAT.

In the early records of the Colony this crop is mentioned as being grown on what may be considered a large scale. The accompanying reports, while not encouraging, possess the advantage of giving clearly the causes of failure which may, in the future, be avoided. Buckwheat is particularly suited to sandy soils, and, though quite distinct from the cereals, is sown at the same time and treated in the same way. It seems to suffer from both drought and frost.

Graaff Reinet (Mr. E. S. Kirkman). Sown September, 1905. Result: Good. Except one light shower, crop had no rain from time of sowing to harvesting. Yield, 26½ lbs. from 2 lbs. Intend sowing again, as pigs, poultry and ostriches eat it readily.

Adelaide (Mr. A. Barker). Sown June or July. Result: Bad. Does not withstand drought and frost. Not suitable or paying for district.

Hermon (J. A. Louw). Sown 24th June, 1905. Result: Bad. Destroyed by rust.

East London (E. Genis). Sown 10th July, 1905. Result: Bad. I think it unsuitable, as it only grew to about 6 inches high when in ear, this may have been owing to late sowing.

Mafeking (H. D. Roberts). Sown 19th July, 1905. Result: Bad. Started flowering 28th August, partly killed by frost, remainder flowered at from 4 inches to 6 inches high, gave no seed, in fact, a total failure.

Queenstown (Mr. S. A. McConel). Sown May. Result: Bad. Came up well, but was killed by frost in July.

Bedford (Mr. J. E. B. Pringle). Sown 1st September, 1905. Result: Fair. Should be sown as a bean crop, 9 to 12 inches apart; does not stand any frost; requires a lot of water, must be sown in loose, rich soil.

East Griqualand (A. W. Sephton). Sown 12th November, 1905. Result: Good. Grows very well, stands well against weeds, should give good results with a fair chance.

Molteno (Mr. A. Francis). Sown 23rd September, 1905.

Result : Bad. Killed in part by frost 10th October, later destroyed by hail ; too weakly.

Riversdale (Mr. J. A. Nel) Sown 15th June, 1905. Killed by frost, might do if sown in summer.

Tarkastad (H. Thackwray). Sown July, Result : Negative. Sown at the time of sowing oats, as stated in pamphlet, but killed by frost.

Bathurst (Mr. R. W. Elliott). Sown 21st August, 1905. Result : Bad. Return about 2lbs. from 10lbs. Unsuitable I think as compared with barley or mealies.

SUNFLOWER.

This may be regarded as a crop of limited use being chiefly valuable as a poultry feed, also given to horses and sheep. Recently enquiries have been made of the Department by persons open to buy the seed if procurable as well as from farmers having seed to sell.

Sunflowers are sown on land prepared as for mealies and are sown in drills three and a half feet apart using 20 to 30 pounds of seed per morgen and thinning out the plants when about 8 inches high, to a distance of from 18 to 35 inches apart. Sow earlier than is usual for mealies, and in harvesting gather and dry the whole heads.

East Griqualand (Mr. A. W. Sephton). Sown 12th November, 1905. Result : Good. Gives a very heavy yield. No disease.

Colesberg (Mr. Alex. Robertson). Result : Fair. Grows well but greatly destroyed by birds ; for this reason, I think mealies better.

Somerset East (Mr. R. H. A. Bowker). Sown 4th October. Result : Fair. Grows well but I don't think crop will pay, practically all seed taken by birds.

Grahamstown (Mr. C. G. Hards). Sown 4th September, 130 lbs. from about an acre, birds troublesome ; excellent for poultry, and horses ; very hardy and requires very little labour. This crop will pay in this District.

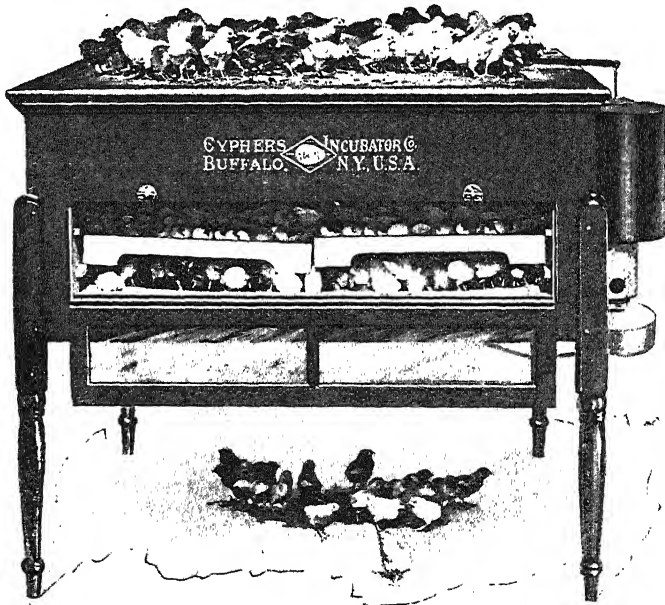
Chicory and Cotton were dealt with in the previous issue. In future numbers, reports, up to date, will be furnished on other crops being tried, on grasses, clovers and other leguminous crops, cereals &c. As necessity arises fresh supplies are obtained and parcels are being continuously sent to all parts of the Colony, over twelve hundred farmers now co-operating with the department in these trials. A report of the result, whether satisfactory or otherwise, is the only stipulation made and it is earnestly requested that those to whom report-forms have been issued will kindly fill them in and return them, in order that accurate data may be collected and further statements published from time to time.

POULTRY FOR PROFIT.

Incubators, and How to Work Them.

CHAPTER II.

There are two sorts of incubators, non-moisture and moisture machines. In this chapter I shall deal solely with non-moisture machines. I have had experience with many machines of this description. Some are to be depended on, others the reverse. The essential points of an incubator are as follows: A box or tray to hold the eggs and an arrangement or device for heating them. The eggs, of course, must be kept at a regular temperature, and in order to regulate the temperature, a device called a thermostat is



used. Of these there are many patterns; some are made of metal, others depend on the expansion of liquids. In my opinion the former is the better, as the metal is less liable to deterioration. In buying an incubator, you must make certain that the machine which you are buying is a self-regulating one, that is, that it will keep a uniform heat without requiring constant attention to the regulation of the temperature. The machine that I have

had the best results with is a Cyphers *Standard*. It does its work with very little attention, in fact, 10 minutes morning and evening is all the time I usually spend on it.

When you have decided what machine to purchase, you next want to make up your mind as to the size. They are made in various sizes, viz. : 60 egg, 120 egg, 240 egg, or 360 egg. The 120 egg machine is the one I recommend to those who have a fairly large number of fowls, as the smaller machine costs you just as much to work, and occupies the same time in handling. Having decided this question, you will require instructions in working. Every machine contains a book on how to work it, but a few extra hints will not be out of place here. Do not put any eggs into the machine until you have learnt to regulate it. Run the machine empty two or three days before you put the eggs in. As soon as you have the machine up to the required heat (103°), and everything is working smoothly, put the eggs in. You will need to be careful at this juncture, because as soon as the eggs get heated artificially, they begin to develop an animal heat which, of course, will affect the heat of the machine. If you find the temperature higher than 103° , turn the nut on the top of the machine, so that you will raise the damper (a flat round plate suspended on the regulating lever) over the flue slightly ; this will allow the surplus heat to escape from the incubator. If the eggs have been in the machine for two hours, and the thermometer is still at $102\frac{1}{2}^{\circ}$ — 103° , you may feel certain that your machine is doing its work correctly. The eggs will now require no more attention, except turning morning and evening. The eggs do not require to be turned until they are 24 hours in the machine. About the sixth day the eggs will require to be tested, as any unfertile eggs which are left in the machine go bad, and poison the good eggs which may be in close proximity to the bad ones. This will shew you that it is absolutely necessary to remove all unfertile or addled eggs.

Testing the eggs is a very simple operation. A tester is sent out with each machine, and requires no description. At the end of the nineteenth day, the eggs ought to begin pipping. As soon as you see the first egg chipped, close the door of the machine, and do not on any account allow it to be opened. It is absolutely necessary to pay strict attention to this, as all the natural moisture must be kept in the machine. Leave the ventilators at the bottom of the machine open until the nineteenth day, then close them. If the thermometer shews 104° or 105° on the nineteenth or twentieth day, it will do no harm ; in fact, it is a sign you are going to have a strong hatch. Next week I shall deal with moisture machines. I will be glad to answer queries on any points that may not seem clear. I am indebted to Messrs. Geo. Findlay & Co., of Cape Town, for the use of block illustrating incubator.

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith. A *nom de plume* may be attached for publication.

"Poultry for Profit."

A Practical Critic.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—As a utility poultry-breeder, I must take exception to many of the points raised by your contributor, "Shamrock." I think you will admit that, having kept some thirty breeds of poultry, and at times had an output as high as 125 dozen eggs a week, that I ought to know a little about this subject. If your correspondent was writing for the "fancy," I would take no exception to his words; but as his advice is to us farmers, we say, "Go steady, and don't put all your eggs in one basket." Those high-flown theories never did the poultry-farmers any good. Supposing farmers were to listen to "Shamrock," how many eggs would they sell at 16/- to 21/- a dozen. Then his price for cross-bred fowls at 4/6 is much too high. They have been selling on Port Elizabeth market at from 1/3 to 2/6 each, a price at which, if the raiser had to buy all the food, I make bold to assert, the balance would be on the wrong side. The price of pure-bred birds, 7/6 to 21/-, is few and far between. Then your correspondent contradicts himself. He says, "What I mean by poultry-raising is scientific, systematic poultry-raising." Further on he says poultry-raising is not a science, and any one can raise fowls successfully. Can he? I do not believe it. Lewis Wright says, in his poultry book, speaking of a poultry man at Home, who is well versed in all that pertains to successful poultry-raising, that he is worth his weight in gold. If this is his experience at Home, where there are so many to choose from, what can be the conditions here? Having been one of the delegates attending the first poultry conference, I say advisedly that utility poultry is being kept in the back ground. We cannot all be in the "fancy," and in some points we say the "fancy" are on the wrong lines. The fowl with me is the one that will lay the most eggs in a given time, and one that will mature the quickest. There is too much head-gear in the "fancy." We do not eat giblets here, and those large combs, for utility purposes, are useless. When the late Mr. Cook was here lecturing, I knew several young men who embarked in poultry without any previous experience. My advice to them was to go slowly; but they had eggs on the brain. To them it was 100 eggs in the incubator, twelve weeks after 90 ducks at 4/- each, and, "hey presto!" that's how the money is made. What was the sequel? Two years after they gave it up in disgust, after losing nearly £200, sadder, if not wiser, men. And this is not an isolated case by any means. Two young men a few weeks since came to have a look round here, and asked my advice regarding poultry-farming. They had got tired of town life. I enquired if they had any previous experience, and found that they had not, and only very little capital. Under these circumstances I

could not advise them to embark in the venture. Those high-flown theories are all very well on paper, but somehow they do not work out in practice. If you have a liking for the work, and are prepared to give it your attention week in and week out, you may succeed. But to embark on it as some advise, and think a success is going to be achieved without experience, is to court failure. When I had time to attend the poultry myself, it was quite a success; since then, having had to leave it to others, it has been, to say the least, not a success.—Yours, &c.,

J. MARTIN.

Perseverance, June 12.

Incubator Failures.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I am not a subscriber to your paper, but by accident I just got the January issue, and would like to supply some information about "Incubator failures" to the question of Mr. T. P. Cilliers, Paarl.

There is not sufficient explanation about the room; but, as it is said, the room is quite dark and no window in it, it certainly seems that room has not sufficient ventilation. There is no need at all that an incubator room should be dark; it may be quite light; the main point is a good ventilation.

The room should not be damped, as an unventilated room is always damp and mouldy enough. To damp a dry, well-ventilated room may sometimes be advisable.

Furthermore, Mr. C. should only breed in the breeding season, as he will only get good results then. In the warm season, when the temperature is, say, about 90 degrees, there are only very weak air currents in the machine, and so not sufficient oxygen for developing the chicks is supplied.

Breed only from stock in prime condition, well matured, at the right time; run your incubators in a well-ventilated room, where the air is always pure, fresh, and sweet, and you will have good results.

Further information given if wanted. My hatches with Cypher's machines run up to 95 per cent.—Yours, &c.,

KARL MEYER,

of the Darling Poultry Farm.

Darling, June 15.

Eradication of Dodder.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Regarding Mr. Mulder's letter in the May number of your widely-read *Journal*, we sell preparations for the destruction of weeds, dodder, scrub, and prickly pear, prices as follows:—Powder 14 lb. tin, 5s. each; also, smaller tins, at 10s. 6d. and 20s. per dozen. In fluid form the price is 6s. per drum.

Both these preparations are scientifically prepared, are soluble in cold water, and will not explode.

Regarding the formula, given in the same issue for an Arsenite of Soda mixture, to which no price is attached, would it not be as well if the Department, instead of pushing Arsenite of Soda, which is imported and sold under conditions not allowed to other dips, make tests in order to find out which really is the best cattle tick dip, and then, putting all on a fair basis, allow competition to bring the best to the front?

It is most unfair to traders in this country to see a preparation of Lime and Sulphur (which was bought by the Department of Agriculture at a high price) hawked round and being sold or given away to unwilling buyers.

Whilst we recognise the great work which is now being done by the Department of Agriculture, if they wish to compete with dip manufacturers, the taxpayers ought to know exactly how much the Department loses by the competition.—Yours, &c.,

HAYWARD, YOUNG & CO;

Bars in Ostrich Feathers.

To the Editor, AGRICULTURAL JOURNAL.

SIR—I see that the question of bars in ostrich feathers is attracting a great deal of attention at present. Might I point out that in the *Agricultural Journal*, No. 7, Vol. XIX, dated Thursday, September 26, 1901, a report by the late Mr. William Cook, the Poultry Expert, is published, in which that gentleman expressed himself as convinced that these bars were caused by lice biting off the fluff to weave into the cells for the deposit of eggs? In this article Mr. Cook stated that a remedy had been prepared, and farmers would no doubt be glad to learn if anything further was heard of in this connection.—Yours, &c.,

R. C. MACDONALD.

Armada, Bluecliff, June 1.

Storing Potatoes.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I would be much obliged if you could inform me as to the best methods of storing potatoes through the winter months, and would be glad of the information as soon as possible.—Yours, &c.,

W. G. C. ANDREWS.

Ficksburg, May 3.

The reply was posted:—Potatoes are stored in pits in some places, being well protected from damp by layers of straw. Others store in cool, dark cellars, packing the potatoes in light barrels; while well-protected lofts have been found to answer as well. As good a plan as any is to store on the lands by clearing a space, stacking the potatoes there and covering with straw and earth or dried haulms and earth. Of course the ground must be dry underneath, and precautions be taken to prevent water draining on to the stack. In using this method in this country care must be taken that the potato tuber moth is not around, otherwise it provides a magnificent breeding ground for that destructive pest.

Ostriches and Paspalum.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Could you give me any information as to whether ostriches like *Paspalum dilatatum*?—Yours, etc.,

B.W.

Middelburg, C.C., May 23.

Ostriches will eat *Paspalum* grass and seem to like it, but we have no information as to its feeding value for these birds. They seem to thrive so well on lucerne that no one looks for a more suitable pasture.

The Fruit Congress and Horticulture.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In the *Agricultural Journal* for May just received I notice a paragraph entitled "Fruit Growers' Congress" and giving the dates of meeting, 23rd and 24th May, at Cape Town. I wish to draw attention to the fact that the name "Fruit Growers' Congress" as applied to this meeting is incorrect. It is really a meeting of delegates from the Western and Eastern Boards of Horticulture, and although fruit-growing occupies a foremost position in the horticulture of this Colony, it is desirable that other important questions regarding horticulture should be brought forward and discussed at these meetings as well. Delegates should be encouraged to discuss any question of importance in reference to horticulture generally and not reduce the Conference to discussing matters relating to fruit-growing only.

I also notice that two subjects have been received by the Secretary for discussion at the meeting, both of which, I consider, are out of place and do not concern the Horticultural Board as such; the first that Government be asked to reconsider its decision *re* the amounts contributed to Agricultural Societies, except so far as it affects the Horticultural Section at agricultural shows, and I think this question is one which the Agricultural Union should take up as more nearly affecting its interests than that of the Horticultural Boards.

Likewise the second question of the amalgamation of Agricultural Societies and Farmers' Associations. Surely the Societies concerned should be able to come to some agreement in this respect, if such seems desirable, without the interference of the Horticultural Board; surely there are enough matters connected with horticulture needing discussion without bringing in outside matters which do not concern us.

Yours, etc.,

G. W. LOCKIE,

Hon. Secretary, King William's Town Horticultural Society.

May 9th.

On receipt of this we pointed out to our correspondent that the Congress in question is not, as he seemed to think, a meeting of delegates from the Western and Eastern Horticultural Boards. It is a Congress of Delegates, representing the Fruit Growers and Viticulturists, who elect the members of those two Boards. Each Fruit Growers' Association (in most cases they are Farmers' and Fruit Growers' Associations) sends delegates to this Annual Congress. This reply evoked the following letter:—

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In reply to your favour *re* the Fruit Growers' Congress, I may have made a mistake in stating that the delegates to this Conference were sent by the Eastern and Western Horticultural Boards; but as you state in your reply that delegates to this Conference elect the members of these Boards at their meetings, I think there is room for my protest that farmers, when attending these meetings, should remember they are gathered together to further the interests of horticulture in this country, and not merely to discuss agricultural questions which can be better done at the Agricultural Union and Farmers' Congress meetings.—Yours, &c.,

GEO. LOCKIE,

Hon. Sec., King William's Town Horticultural Society.

This, of course, opens a wide field for discussion. Whether the Vine and Fruit Growers, when they assemble in Congress, would coincide in the views expressed by our correspondent, is quite another question. Very few of them are deeply interested in general horticulture, while all are more or less interested in general farming questions.

Blindness in Sheep.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In the *Agricultural Journal* a short time back I noticed some one asking for a cure for blindness in sheep.

I might offer a preventive, if not too simple.

My experience shows that giving sheep salt and sulphur as a lick twice a week during the months you expect the sheep to be troubled, is effective.—Yours, &c.,

J. H. KING.

Tarkastad, May 22.

Arsenic for Rats.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—H. Le G. Solly, of Sir Lowry's Pass, March 24, 1906, enquiring about Daryz virus for rats. I may state that I have found arsenic boiled in water for a few minutes, then placed in saucers in lofts, has proved very satisfactory. The mice don't seem to smell much, as the arsenic seems to preserve them.—Yours, &c.,

D.E.

Spitzkop, June 15.

An Injured Goat.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—This morning I noticed a boer kapater found difficulty in breathing, and did not look well. I had him slaughtered, and found everything in good order, excepting the ribs had grown fast to the fat connecting the lungs, heart and liver, only on the left side. There was a very small abscess formed below the wind pipe, against the breastbone. In taking out the pluck, about one-and-a-quarter gallons of water came out of little water bags, between the pluck and ribs. Is this serious or not?—Yours, &c.,

D. E.

Spitzkop, June 15.

Mr. D. Hutcheon says:—I am of opinion, from the description that the inflammation, abscess, and effusion of serous fluid, &c., were originally caused by some direct injury—some sharp-pointed body which had forcibly pierced the ribs. It is of no pathological importance, and not likely to be infectious.

Lamziekte amongst Cattle.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Arising out of the discussion at the meeting of the Griqualand Farmers' Society on the 9th inst., it was admitted by all present that the disease of Lamziekte is slowly but surely spreading, and thus is jeopardizing the chief farming industry in this part of the Colony; and the efficacy of feeding cattle with crushed bones, or bone meal, from the experience of some of the farmers present, was very doubtful.

The Veterinary Department pin their faith to bone meal and strongly recommend its use, and they have induced the Government to carry it free over the Cape Government Railways, which is a great consideration.

The Veterinary Department also attribute the disease to the deficiency of phosphates in the pasture. If this be so, how is it that cattle in the pink of condition are attacked, and more especially cows at or near the period of calving, and the cows that are usually attacked are those that appear the fattest, healthiest and best-conditioned animals in the herd? They are suddenly struck down by this fell disease (Lamziekte), which, I think, is a form of paralysis, and die within 48 hours and even less time than this.

We are told this disease is not infectious or contagious, yet the experience of most farmers is that, if the intestines and their contents are not very carefully buried or burned, and other animals should by accident get at these and contents, they will contract the disease.

Now, if it is really want of phosphates in the pasture, and this deficiency can be supplied by the use of bones, one would reasonably conclude that the disease would be very slow in its action, and that the animals affected would fall off in condition and pine away, but the opposite is exactly the case.

Then, again, can bones be assimilated in sufficient quantity to prevent the disease? Some farmers state that as soon as crushed bones or bone meal, were given to their cattle, they stopped dying.

Now, I think it would take some time before the bones could have any effect at all.

Then this raises another question, will bones chemically acted on by the gastric juices of the stomach, produce phosphates (another form of bone) in the animal? I cannot think they will, but I can understand bones being distributed over the veld by cattle which have been fed on crushed bones, or bone meal, after decomposition, to *create phosphates in the pasture*, and thereby supply the deficiency.

This would be only reasonable, but the other theory is doubtful.

I do not think our present-day medical practitioners would prescribe bone meal, as an active agent for the cure of paralysis or kindred diseases.

I am not writing these few remarks in any sense disparaging to our Colonial Veterinary staff, but I think this disease requires much more careful investigation than it has hitherto commanded, as it is very prevalent in Griqualand West and adjacent territories, and is one of the most insidious diseases that our farmers have to contend with.

In the interest of the cattle raising industry, and of the farmers of Griqualand West and other portions of the Colony where this disease prevails, I trust this matter will not be allowed to drop until thoroughly investigated by the Agricultural Department.

Yours, etc.,

A. GUNNING.

Kimberley, June 11th, 1906.

With respect to the preventive effects or otherwise of Bone meal for Lamziekte, the experience of men like the Messrs. Carter Brothers clearly shows that bone meal is a preventive of what is recognised as real Lamziekte and Stijfziekte. This is a matter however, which can easily be proved, if the farmers are prepared to arrange to make the following trial experiment.

Let them select one of the farms on which Lamziekte prevails most persistently, and let it be stocked with cattle, the Government may then be prepared to supply bone-meal free, and make arrangements which will insure that every beast gets a sufficient quantity regularly for a year or more as may be considered necessary. It will be equally necessary to vaccinate all the cattle against Anthrax as well, which is very prevalent on many farms in Griqualand West. It is cases of this disease which, occurring as it does at the same time as Lamziekte, strengthens the belief that Lamziekte is a contagious or infectious disease. In connection with this subject of infection, referred to by Mr. Gunning, it is necessary to mention that Mr. Bowhill, Director of the Veterinary Laboratory at Grahamstown, has discovered that the acute cases of so-called Lamziekte, which die within 36 to 48 hours are chiefly, if not wholly due to a special class of micro-organisms called *Pasteurella*, Vide *Agricultural Journal*, April 1906.

Mr. Gunning says:—"If this disease were due to the lack of phosphates in the vegetation, how does it occur in cattle in the pink of condition *i.e.*, such as cows at or near calving." Without attempting to prove that this disease is due to a deficiency of phosphates; if it were so, cows near calving, or soon after, while giving a full supply of milk, and young growing stock are the principal victims to this disease and these are the cattle which require a greater proportion of phosphates than dry and full-grown cattle.

The Assimilation of bone-meal.—Experiment has shown that bone meal is readily digested in the gastric stomach of ruminants. Crushed bones, unless the pieces are very small, are not readily digested, vide *Agricultural Journal* for February last (Vol. XXVIII. No 2). When bone-meal is digested it at once enters the blood circulating through the body, and at once becomes assimilated by the osseous and other tissues requiring it. The principal salt of bones is Phosphate of lime. As soon, therefore, as the bone is digested its constituent elements are as readily assimilated as if they came originally from a bag of wheat.

The phosphates from bones do not form new bones, but increase the nourishment most essential to the already formed bones.

I agree with Mr. Gunning that a medical practitioner would not prescribe bone flour to his patients for paralysis, but if he found a family suffering from Rickets, I do not know that he could prescribe anything much better.

I am one with Mr. Gunning, however, in admitting that this acute form of lamziekte requires further investigation, and if I could possibly detail an officer to take the matter up, I would be very pleased to do so.—D. HUTCHESON.

Heartwater and Dropsy.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I notice something about Heartwater in your *Journal*. This disease is caused by hair-worms; if no hair-worms are present, a sheep will not contract the disease. Sores or ulcers are formed in the bowels. Whether or not the hair-worms deposit their eggs in these sores, I do not know; some veterinary surgeon or farmer will, perhaps, enlighten me.

Turn the sheep early into the kraal; let it fast; take 10 lbs. of common salt; mix one tablespoonful of this with some powdered blue-stone, then administer in the morning on the spot where the sheep has its salt lick. Repeat until sores are healed. Keep the animal away from water for an hour after treatment.

If the sheep will not eat the salt, take one pound of blue-stone to 40 bottles of water, mix well, and dose the sheep in the same manner. For a full-grown animal two tablespoons; for a lamb one tablespoon. Be careful not to give too much; for this purpose a small graduated bottle would be useful.

Administer the salt mixture or the blue-stone mixture every fortnight.—Yours, &c.,

D. J. MAARTENS.

Ospoort, Kokstad, Griqualand.

Mr. Maartens is in error when he states that Heartwater is due to worms. We certainly get dropsy associated with the presence of wire worms, or fluke, but if Mr. Maartens saw a case of real Heartwater and a case of dropsy associated with the worms, he would have little difficulty in recognising the difference. The fluid found in the heart-bag, and chest cavity in Heartwater is a straw-coloured fluid, which coagulates into a firm jelly immediately it is exposed to the atmosphere. In dropsy on the other hand, the fluid is a clear limpid serum, with no tendency to coagulate. The sores or ulcers on the walls of the intestines have also a parasitic origin. They are not associated with the wire worms of the stomach but are believed to be caused by a small WhiteWorm which is found in the large intestines.

With respect to dosing sheep with bluestone I would earnestly direct Mr. Maartens's attention and Mr. Green's, to my latest instructions vide *Agricultural Journal*, Vol. XXVII. No. 6, (Nov. 1905).

D. HUTHEON.

Strychnine for Wire Worms.

To the Editor, AGRICULTURAL JOURNAL

SIR,—Being greatly troubled with "Wire worm" (*Strongylus contortus*) in my sheep and goats, I, on the 3rd March, fasted 1,600 stock (equal proportions of Merinos, Persians and Angoras) for 18 to 24 hours, and dosed same with Sulphate of Copper, at a strength of 1 lb. to 7 gallons of water giving lambs 9 months old 2 oz., sheep 12 to 18 months 3 fluid oz., and over 18 months 4 fluid oz; I lost no Angoras and no Merinos, but 35 Persians died, some from the direct effects of the dose on the fourth stomach and intestines, but mostly from inflammation of the lungs caused by choking; Persians were very wild and struggled a lot.

All stock improved for a while but about the 10th April I noticed signs of "wire worm" again, so on the 20th April I dosed 500 Persians and 300 Angora Ewes, using 1 lb. of Sulphate of Copper to eight gallons of water; no Angoras died but 28 Persians died, some from inflammation of the fourth stomach, but mostly from inflammation of the lungs.

The Merinos I was then afraid of dosing, so gave them a mixture of one part of Sulphate of Copper to ten of salt, giving each sheep a teaspoonful. As this seemed to give no beneficial results I dosed them on the 9th June using 1 lb of Sulphate of Copper to 10 gallons of water, doses as before, also fasting them 18 to 24 hours.

In all I dosed 500 Mer nos, 70 Persian Ewes and 70 Angora Kapaters, no Angoras died and this time I did not choke a single thing, but 9 Merinos and 4 Persians have died from the direct effects of the dose on the fourth stomach and small intestines.

All Sulphate of Copper was bought direct from a chemist and appeared to be of good "Commercial value."

No stock received water after dosing and every care was taken as to weights and measurements.

I should therefore like Dr. Hutcheon's opinion on above through your columns, and in my opinion seeing that we cannot depend on the strength of Sulphate of Copper, I would ask if the Veterinary Department have ever tried a mixture of Strychnine and water.

I fancy that no amount of Strychnine would kill a goat or sheep whereas the "Wire worm" being in a way a carnivorous "thing" ought to die from it at once.

Also, seeing that the operation of dosing with the necessary fasting is dangerous to the health of stock, and that a lick of Sulphate of Copper and Salt is not so effective as to be a cure, I would ask how much Sulphate of Copper could safely be put in a water trough holding 180 gallons of water, supposing each sheep drank three-quarters of a gallon of water?—Thanking you in anticipation, —Yours, &c.

ARTHUR GREEN.

Paradise, Vryburg, B.B.,
11th June, 1906.

Mr. Green is under some misapprehension with regard to the supposed immunity of herbivorous animals to strychnine. I once had the misfortune to kill a horse with five grains of strychnine. I gave the animal, which was suffering from acute stomach staggers, 3 grains about 8 p.m., and twelve hours after I gave 2 grains. The animal died in a continuous spasmodic fit three hours later. I am told that porcupines can stand very large doses, and that the common Boer goat is not over-sensitive to its effects, but all our farm and domestic animals are susceptible to its poisonous action, in varying doses. I cannot, therefore, recommend its use in the treatment of wire-worms.—D. HUTCHEON.

RURAL REPORTS.

For the month ending 15th June, 1906.

Bedford.—Condition of veld excellent, Karoo quite green. Fortunately, there have been no locusts so far. Cold days with occasional high winds. Rainfall quite up to the average. Lucerne short, but keeps a green tinge, and is good for grazing stock. Stock generally doing well.

Robertson.—Veld in bad condition for the time of the year. Weather cold and dry. Rainfall light, compared with previous seasons. Most of the vines are in good condition, but some are getting bad on account of Phylloxera. There is a greater quantity of barley sown than of any other grain. Stock generally doing well.

Somerset East.—There is little to add to my report for last month. During the past month $2\frac{1}{2}$ inches of rain fell, and the weather has been seasonable. Pasturage is abundant, and stock of all kinds are in prime condition. Farmers have been able to plough, and it is anticipated that a very large quantity of cereals will be sown.

THE TRANSKEI.

For the month ending 31st May, 1906

Cofimvaba.—The weather has been exceptionally mild for this time of the year. The rainfall registered during the month was 0.95 inches, which tended to freshen up the veld and improve the winter pasturage. At the close of the month, there were thirteen areas quarantined for red-water. Now that we have had frosts, I have no doubt the disease will soon die out. Natives are still harvesting their crops. Taking it as a whole, mealies will not be so scarce as was first anticipated. The yield of Kafir corn proves to be a good one. The state of stock is normal.

Flagstaff.—The weather during the month has been somewhat cold, accompanied by showers of rain which will have the effect of keeping the veld in a better state than is usual in winter. Stock are in good condition, and free from disease. The natives are reaping their crops, and the harvest promises to be a fair one.

Kentani.—The reaping season is now pretty well over. On the whole, the mealie crops have been fair, but below the average. Very little Kafir corn has been reaped for the reasons stated in my report for March. Seasonable rains have fallen, and the pasturage is all that can be desired.

Kokstad.—Veld in poor condition. Cold and frosty nights, with bright sunny days. Rainfall light. Cereals and stock in fair condition.

Lusikisiki.—Veld in good condition. Weather warm. Average rainfall. Condition of cereals poor. Cattle and pigs in good condition; horses, sheep and goats fair.

Matatiele.—The weather during the past month was phenomenally mild for this time of the year in these latitudes. Towards the middle of the month a little rain fell, followed by a couple of nights' frost, but no damage was done. On the Berg the veld is still very good, and in some places quite green. All stock is in good condition, and the district is entirely clear of animal disease of a contagious nature. The Mealie and Kaffir-corn crops are distinctly good, and reaping is in full swing. There is abundance of forage (winter oats) in the district.

Mount Ayliff.—Veld in good condition, and weather mild with light rainfall. Condition of Mealies fair that of Kaffir-corn poor. Stock generally in good condition.

Mount Frere.—There were some very acceptable showers during the month, which will practically ensure the veld being good during the winter months. Reaping has now begun. The crops in most parts of the district are far below the average and worse than was anticipated. Stock of all description is in good condition. There has been a fresh outbreak of lungsi:kness infecting several kraals. The usual precautions have been taken and the infected herds quarantined.

Port St. John's.—Weather cold with average rainfall. Nothing special to report.

Tabankulu.—A few showers of rain fell during the past month, sufficient to benefit the veld, and stock are in good condition. The crops also are being gathered in; these will be below the average.

Umtata.—There is no matter of importance to report for the past month. The winter is making pasture and stock in a miserable condition. Several late frosts have tended to increase the severity of the season. The Natives are busy reaping their Mealie crops from the past year, and the winter crop of barley is well advanced.

Willowvale.—Slight showers fell during the month, keeping the pasturage fairly green. The weather has been favourable with occasional heavy winds. There is no change in condition of stock and value of same for the current month.

NOTES ON THE WEATHER OF MAY, 1906.

By CHARLES M. STEWART, B.Sc., Secretary to the Meteorological Commission.

Mean pressure slightly above the normal, average temperature but with days cooler and nights warmer than usual, frequent light frost during the early part of the month, a moderate number of thunderstorms, cloudy skies with frequent local fogs, rainfall considerably above the average with falls of snow and sleet towards the end of the month, and light winds with frequent calms were the leading points in connection with the weather of May.

Precipitation.—The mean rainfall during this month amounted to 2·16 inches, falling on 6 days, as shewn by the record from 318 stations—being 0·35 inch or 19 per cent. below the average. From the tabular statement given below, it will be seen that

Division.	Mean Rainfall (1906).	Mean No. of Days.	Average Rainfall (1891-1900).	Average No. of Days.	Actual Differences from Aver- ages.	Percentage Differences from Aver- ages.
	Inches.		Inches.		Inches.	Per cent.
Cape Peninsula ..	4·06	11	4·80	9	— ·74	— 15
South-West ..	2·23	7	2·90	7	— ·67	— 23
West Coast ..	·95	5	1·51	5	— ·56	— 37
South Coast ..	5·26	11	2·36	6	+ 2·90	+ 123
Southern Karoo ..	1·41	5	·99	4	+ ·42	+ 42
West Central Karoo ..	1·93	6	·85	3	+ 1·08	+ 127
East Central Karoo ..	2·42	6	·79	3	+ 1·63	+ 206
Northern Karoo ..	1·18	4	·85	3	+ ·33	+ 39
Northern Border ..	1·26	4	·62	3	+ ·64	+ 103
South-East ..	1·50	6	1·35	5	+ ·15	+ 11
North-East ..	1·31	5	1·02	4	+ ·19	+ 19
Kaffraria ..	1·30	5	1·10	4	+ ·20	+ 18
Basutoland ..	·76	4	1·38	4	— ·62	— 45
Orange River Colony ..	·14	2	1·04	3	— ·90	— 87
Durban (Natal) ..	1·76	6	·94	..	+ ·82	+ 87
Bechuanaland ..	·27	1	·50	1	— ·23	— 46
Rhodesia ..	·19	1	·45	1	— ·26	— 58

the excess was due principally to an unusual prolongation of the autumn rains which were considerably in excess of the normal over the greater part of the Colony, and apparently in Natal, particularly over the South Coast, the Karoos and the Northern Border, precipitation being relatively heavier over the East Central Karoo where it was 206 per cent. above the average than elsewhere although the actual wettest area was the South Coast with a mean of 5·26 ins. or 123 per cent. more than usual.

The deficit in rainfall was confined entirely to the Cape Peninsula, the South-West, and West Coast divisions of the Cape Colony; although Basutoland, the Orange River Colony, Bechuanaland, and Rhodesia were similarly affected, the deficiency ranging from 87 per cent. over the Orange River Colony to 15 per cent. over the Cape Peninsula. Speaking in general terms, the rainfall of May was light and practically general over the Cape Colony, as evidenced by the fact that of the 318 stations, only 3 reported "Nil," whereas 84 had totals for the month of 1 inch or less, and 116 from 1 to 2 inches; of the remainder, 49 stations, distributed over all the divisions of

the Cape Colony, with the exception of the Northern Border, had between 2 and 3 inches; 23 had 3 to 4 inches; 18 had from 4.01 to 5 inches; 12 had 5.01 to 6 inches; 6 from 6.01 to 7 inches; whereas only 7 stations scattered along the South Coast exceeded 7 inches. These were Cape St. Francis, 7.92 inches; Harkerville, 8.52 inches; Plettenberg Bay, 8.83 inches; Witte Els Bosch, 9.14 inches; Lottering, 9.47 inches; Blaauwkrantz, 12.11 inches; the highest being Storm's River, with 12.91 inches. The generally light nature of the rainfall is well shewn by the analysis of the maximum daily totals recorded, no fewer than 217 of the 311 stations having maxima of 1 inch or less (exclusive of the 3 with "no rainfall"), 74 had maxima of 1.01 to 2 inches, and 12 of 2.01 to 3 inches; the remaining 5 were Witte Els Bosch, 3.22 inches; Plettenberg Bay, 3.77 inches; Lottering, 4.50 inches; Blaauwberg, 5.89 inches; and Storm's River with the exceptional amount of 8.59 inches; all on the 17th. *Thunderstorms* occurred from 1st to 6th, 9th to 11th, 16th to 18th, and on 31st, being reported from altogether 125 stations on these 13 days. The most severe storm seems to have been that on the 18th at Kokstad, when a native (Griqua) was killed, although the heavy rains along the South Coast seem to have been closely connected with these disturbances. *Hail* fell at 2 stations on 17th and 18th. *Sleet* was reported from 10 stations on 8 days, chiefly the 29th, whilst *Snow* occurred at Glencairn, Katberg, and Bazeya on the 29th.

Temperature, Cloud, and Winds.—The mean temperature of all the stations was 58.0°, or the same as the normal; the mean maximum (68.6°) being 1.8° below and the mean minimum (47.1°) 1.8° below the corresponding averages. The mean monthly temperature shewed a decrease of 3.1° as compared with April, the decrease in the day temperature (4.6°) being double that in the night temperature, reducing the mean daily range to 21.2°, or 3.6° less than the average. The monthly temperature was about the average all over the country, the greatest difference being *minus* 2.7° at O'okiep and *plus* 2.1° at Kimberley. Considered generally, the day temperatures were from 1 to 4 degrees lower than usual, whilst the nights were warmer by about the same amounts. The mean warmest station was Port St. John's with 64.9°, and the mean coldest Rietfontein (Aliwal North) with 50.6°, a difference of 14.9°. The highest mean maximum was 75.4° at Hope Fountain in Rhodesia, and the lowest mean minimum 36.6° at Leribe in Basutoland. The warmest days were most commonly the 1st, 2nd, 9th, 10th, and 16th, whilst the coldest mornings were generally those of the last week of the month, *i.e.*, from the 23rd to 30th. The mean of the highest temperatures recorded was 82.3°, and of the lowest 37.3°, yielding a mean monthly range of 45.0°, the decrease from last month being practically the same in both cases. The absolute maximum for the month was 94.0° registered at East London on the 8th, and the corresponding minimum 26.6° at Leribe on the 26th, an extreme monthly range of 67.4°. Taken altogether, the month may be said to have been exceptionally mild and devoid of great extremes of temperature, closely resembling April in this respect. *Frosts* were of much wider occurrence than during April, being reported from 66 stations on 17th days of the month. The early part of May would appear to have been unusually free from low temperatures, only three (3) frosts being noted between the 1st and 17th, *viz.*, on the 7th, 13th, and 14th. They were of daily occurrence during the last fortnight, more particularly from the 24th to the 28th. In consequence of the severity of the frosts at Kokstad, the grass is looking brown, although the cattle are reported as being in fair condition there.

The mean percentage of *Cloud* during the month was 44, being 4 per cent. more than last month and 9 per cent. above the average for May. The skies were everywhere more obscured than usual, the mean amount of *Cloud* being slightly more than 60 per cent. over the Cape Peninsula and eastwards to Cape Agulhas; from 50 to 55 per cent. along the South Coast and the South-East, but falling to 44 per cent. at East London, as also at Port Nolloth; inland it was most generally between 30 and 40 per cent. The cloudiest station was Danger Point with 68 per cent., and the clearest skies were experienced at Hope Fountain, where the mean amount of obscuration was only 24 per cent. *Fog or Mists*, largely local, occurred every day except the 7th; they were most frequently reported on the 2nd, 3rd, 8th, 16th to 19th, 24th, 25, and 29th. The prevailing *Winds* were North Easterly to Easterly over the Northern Border and in Namaqualand, Southerly in the South-West, and North-West to West elsewhere, being, however, South-Westerly at Durban and South-Easterly at Hope Fountain. Calms were of frequent occurrence during the month, although the wind was reported to have attained the force of a *Gale* at 12 stations on 9 days, chiefly the 10th. The mean Wind-force for the month was 1.64 on the Beaufort Scale, corresponding to a velocity of 11.2 miles per hour. *Hot Winds* were reported from 5 stations on 3 days, 1st, 13th and 31st, principally the last date. No *Duststorm* was noted during May. An *Earthquake* shock was felt at Kokstad on the 13th. *Aphis* is attacking the Kaffir-corn in the neighbourhood of Mandileni, while measles and mumps are rife at Kokstad.

OBSERVERS' NOTES, MAY 1906.

GROOT DRAKENSTEIN.—Mean temperature 6° above average 7 years; rainfall, 1.85 in. below average 13 years (5.19); total deficiency to date, January—May, 4.22 in. (average 13 years 11.35). The S.E. gale on 28th and 29th did great damage to oat crops, blowing some completely away and scorching the rest as if a fire had passed over them. In some cases re-sowing must be done.

KOKSTAD (The Willows).—Severe frosts latter end of month; weather very wintry. On the 18th were visited by exceptionally severe thunderstorm, which circled over the town for over three hours. Thunder and lightning very severe; a poplar tree in Main Street being struck and a Griqua lad outside town being killed. On same day had also sleet and hail. Slight rumble of earthquake on evening of 13th. Grass is looking brown and frost-bitten. Cattle in fair condition. Mumps and measles very rife.

VRUCHTBAAR.—Rainfall below the average for the month. Beautiful weather for ploughing, fine days, and soil just in best condition to work it. Heavy crops of oranges and naartjes in this district, picking of same just begun.

SUNNYSIDE.—Veld grand. Young crops looking well. Barley in this ward very largely sown this season. Oats rather neglected.

BLOEMHOF.—Veld in excellent order.

RICHMOND.—The winter has been very mild up to the present.

THE MEADOWS (Schoombie).—This month has been exceptionally dry, no sign of rain. Very cold and frosty since the 17th

VAN WYK'S VLEI.—Agriculture apparently abandoned for transport to German territory.

SUNNYSIDE (Albany).—The young cereal crops are coming on well. In want of rain to resume sowing, owing to a few dry N.W. winds at latter part of month.

CARNARVON FARM.—We have had, judging from appearances, less rain than other places; heavy rains early part of month from Jamestown to Aliwal North and O.R.C., all missed this part. Taken all round, it has been a little above the average for rain and less frosts and about the same amount of cloudless and windy days. Locusts apparently gone for the winter. Stock mostly fat and prospects fairly good.

MANDILENI.—Crops bad and aphid attacking Kaffir corn. Hardly any mealies in some parts.

TEMPERATURE, MAY, 1906.

Stations.	Mean Max.	Mean Min.	Monthly Mean.	Abs. Max.	Date.	Abs. Min.	Date.
Royal Observatory ..	65.0	52.8	58.9	75.1	9	45.5	23
Devil's Peak ..	61.4	50.0	55.7	78.0	9	43.0	16
Groot Constantia ..	65.4	51.0	58.2	76.0	10	45.0	29
Simon's Town ..	68.8	55.6	62.2	78.0	10	49.0	23
S. A. College ..	67.6	52.5	60.0	81.0	9	44.5	30
Somerset Hospital, Cape Tn.	65.2	53.0	59.1	79.0	9	45.0	30
Wynberg ..	67.9	51.1	59.5	75.8	9	43.5	23
Sea Point ..	66.2	52.8	59.5	79.8	10	45.6	30
Groot Drakenstein ..	68.1	50.0	59.0	78.8	1	38.4	23
Ceres ..	65.4	43.2	54.3	70.0	4, 7, & 11	30.0	24 & 25
Robertson Plantation] ..	70.5	46.9	58.7	84.0	2	33.5	23
Elsenburg Ag. College ..	66.7	46.9	56.8	79.7	9	37.8	26
Wellington (Hug Sem) ..	68.3	50.1	59.2	79.2	9	40.2	24
O'okiep ..	69.7	46.9	58.3	85.0	1	38.9	18
Port Nolloth ..	68.2	47.9	58.0	89.0	28	41.5	24
Van Staaden's Rivier ..	68.6	50.9	59.8	90.0	1	38.0	29
Cape St. Francis ..	67.1	54.9	61.0	80.0	21	44.0	30
Uitenhage ..	71.3	48.9	60.1	93.5	1	35.0	31
Storm's River ..	67.8	50.2	59.0	87.0	10	41.0	27
Port Elizabeth ..	68.6	54.9	61.8	81.0	1	43.0	31
Heidelberg ..	67.0	47.2	57.1	82.0	2	37.0	29
George Plantation ..	67.1	50.4	58.7	80.5	1	41.0	31
Cape L'Agulhas ..	63.8	55.2	59.5	71.0	13	49.0	23 & 27
Amalienstein ..	69.6	44.6	57.1	85.0	1	32.0	24
Murraysburg ..	65.8	39.6	52.7	80.0	1	30.0	23 & 26
Hope Town ..	70.7	41.4	56.0	82.6	1 & 4	29.0	25
Kimberley ..	73.0	42.8	57.9	86.0	15	33.0	25
King William's Town ..	73.7	46.9	60.3	93.0	1	33.0	30
Cathcart ..	67.0	42.8	54.9	80.7	1	28.8	31
East London ..	70.0	53.6	62.2	94.0	8	46.0	24, 25, & 28
Sydney's Hope ..	66.8	49.7	58.2	90.0	1	39.0	30
Bedford ..	70.4	45.5	58.0	88.0	1	32.0	31
Stutterheim ..	70.9	48.6	59.8	86.0	1	36.5	30
Rietfontein (Aliwal North)	62.2	37.7	50.0	75.0	15	29.0	24
Aliwal North ..	69.1	38.3	53.7	82.0	1	27.0	27
Main ..	70.4	45.8	58.1	86.8	1	31.2	27
Port St. John's ..	73.5	56.3	64.9	84.0	16	47.0	30
Kokstad (The Willows)	68.7	39.9	54.3	84.3	15	28.0	27 & 31
Umtata ..	73.7	45.2	59.4	91.0	1, 2, & 15	32.0	27
Teyateyaneng ..	69.5	36.8	53.2	79.0	2	27.0	27
Leribe ..	69.0	36.6	52.8	77.3	4	26.6	26
Mohale's Hoek ..	68.3	38.7	53.5	79.0	1	27.0	25
Kuruman ..	72.9	41.0	57.0	82.0	16	31.0	28
Hope Fountain ..	75.4	48.4	61.9	82.9	6	43.3	30
Means ..	68.6	47.4	58.0	82.3	..	37.3	..
Extremes ..	..	..	..	94.0	8	26.6	26

RAINFALL, MAY, 1906.

I. CAPE PENINSULA:

	INCHES.
Royal Observatory (a) 12 inch guage ..	3·65
Cape Town, Fire Station ..	3·51
Do South African College ..	4·28
Do Sea Point (Hall) ..	3·76
Do do. (Attridge) ..	3·74
Do Molteno Reservoir ..	4·10
Do Platteklip ..	4·20
Do Signal Hill ..	2·76
Table Mountain, Disa Head ..	3·11
Do Kasteel's Poort ..	5·73
Do Waai Kopje ..	6·83
Do St. Michael's ..	6·50
Devil's Peak, Block House ..	4·78
Do Nursery Guage ..	4·54
Do Lower Guage ..	4·42
Newlands (Montebello) ..	5·55
Bishopscourt ..	5·84
Kenilworth ..	4·61
Wynberg (St. Mary's) ..	4·60
Groot Constantia ..	4·85
Tokai ..	4·74
Simon's Town (Wood) ..	3·35
Do (Gaol) ..	2·66
Blaauwberg Strand ..	2·13
Camp's Bay ..	2·38
Fish Hoek ..	2·61
Cape Point ..	1·03
Plumstead (Culmwood) ..	2·85
Muizenberg (St. Res) ..	5·16
Woodstock (Hall) ..	3·89
Do (Municipal Quarry) ..	4·68
Do (with Nephers Shield) ..	4·31
Cape Town (Hospital) ..	3·27
Maitland (Cemetery) ..	4·25

II. SOUTH-WEST:

Eerste Rivier ..	3·50
Klapmuts ..	3·10
Stellenbosch (Gaol) ..	3·46
Somerset West ..	3·75
Paarl ..	2·96
Wellington (Gaol) ..	3·38
Groot Drakenstein (Weltevreden) ..	3·34
Tulbagh ..	1·91
Kluitjes Kraal ..	2·10
Porterville Road ..	2·64
Ceres Road ..	1·25
De Doorns ..	0·42
Danger Point ..	2·58
Worcester (Gaol) ..	0·72
Do (Station) ..	0·58
Hex River ..	0·57
Karmmelks River ..	1·29
Robertson ..	0·97
Robertson (Govt. Plantation) ..	0·62
Elgin Plantation ..	3·80
Elsenburg Agricultural College ..	2·75
Montagu ..	0·75
Vijgebooms River ..	2·60
Roskeen ..	2·28
Vruchtbaaar ..	4·60

III WEST COAST:

	INCHES
Anenous ..	0·24
Wupperthal ..	0·62
Klipfontein ..	0·41
Kraaifontein ..	0·06
O'okiep ..	0·29
Springbokfontein (Gaol) ..	0·00
Lilyfontein ..	0·71
Garies ..	0·18
Kersefontein ..	1·33
The Towers ..	1·95
Dassen Island ..	2·19
Malmesbury ..	2·53
Piquetberg ..	1·87
Van Rhynsdorp ..	0·40
Clanwilliam (Gaol) ..	0·72
Zoutpan ..	1·73

IV. SOUTH-COAST:

Cape L'Agulhas ..	1·81
Bredasdorp ..	1·09
Swellendam ..	3·38
Heidelberg ..	2·46
Riversdale ..	3·10
Great Brak River ..	2·97
Mossel Bay ..	2·60
George ..	5·82
Millwood ..	6·16
Sour Flats ..	5·16
Concordia ..	6·99
Knysna ..	5·66
Buffels Nek ..	6·83
Harkerville ..	8·62
Plettenberg Bay ..	8·83
Blaauwkrantz ..	12·11
Storm's River ..	12·91
Witte Els Bosch ..	9·14
Cape St. Francis ..	7·92
Zuurbraak ..	3·46
Witteklip ..	4·70
Van Staaden's (upper) ..	4·44
Do (lower) ..	4·40
Uitenhage (Gaol) ..	2·59
Do (Inggs) ..	2·40
Do (Park) ..	2·54
Centilivres ..	1·76
Port Elizabeth (Harbour) ..	4·64
Lottering ..	9·47
Shark's River (Nursery) ..	6·51
Do (Convict Station) ..	5·37
George (Plantation) ..	5·69

V. SOUTHERN KAROO:

Verkeerde Vlei ..	0·92
Touws River (D. E's. Office) ..	0·79
Ladismith ..	2·02
Amalienstein ..	1·74
Calitzdorp ..	1·36
Oudtshoorn ..	1·61
Uniondale ..	1·94
Bok River ..	0·57
Triangle ..	1·10
Pietermaitjes ..	1·67
Grootfontein ..	1·05

VI. WEST CENTRAL KAROO: INCHES			IX. NORTHERN BORDER: INCHES		
Matjesfontein ..	..	0.79	The Halt ..	..	0.43
Prince Albert ..	..	0.52	Kenhardt ..	..	0.96
Fraserburg Road ..	..	1.06	Trooilapspan ..	..	1.60
Zwaartberg Pass ..	..	5.15	Karree Kloof ..	..	1.35
Nel's Poort ..	..	2.46	Dunmurry ..	..	1.86
Camfer's Kraal ..	..	1.97	Griqua Town ..	..	1.25
Baaken's Rug ..	..	2.01	Douglas ..	..	1.39
Willowmore ..	..	1.36	Hopetown ..	..	1.46
Roosplaats ..	..	3.56	Newlands (Div. Barkly West)	..	1.21
Rietfontein ..	..	1.58	Kimberley (Gaol) ..	..	0.78
			Do (Stephens) ..	..	0.93
			Strydenburg ..	..	1.97
			Bellsbank (Div. Barkly West)	..	0.74
			Barkly West ..	..	0.90
			Uppington ..	..	1.44
			Van Wyk's Vlei ..	..	1.81
			New Year's Kraal ..	..	1.84
VII. EAST CENTRAL KAROO:			X. SOUTH-EAST:		
Buffels Kloof ..	..	3.93	Melrose (Div. Bedford) ..	..	1.06
Aberdeen (Gaol) ..	..	2.95	Fairholt ..	..	1.36
Corndale ..	..	3.43	Dagga Boer ..	..	1.32
Aberdeen Road ..	..	1.29	Sunnyside ..	..	1.31
Glen Harry ..	..	2.09	Bedford (Gaol) ..	..	1.57
Kendrew ..	..	2.74	Do. (Hall) ..	..	1.45
Do (Holmes) ..	..	3.34	Sydney's Hope ..	..	2.79
Graaff-Reinet ..	..	3.02	Adelaide ..	..	1.22
Do (Eng. Yard) ..	..	2.92	Atherstone ..	..	1.96
New Bethesda ..	..	1.88	Alexandria ..	..	2.85
Roo de Bloem ..	..	2.16	Salem ..	..	1.73
Bloemhof ..	..	2.05	Graham's Town (Gaol) ..	..	1.58
Spitzkop (Graaff-Reinet)	..	2.99	Heatherton Towers (near Graham's		
Bruintjeshoogte ..	..	2.37	Town) ..	..	0.70
Patrysfontein ..	..	1.66	Fort Beaufort ..	..	0.73
Toegedacht ..	..	2.17	Katberg ..	..	1.65
Klipfontein ..	..	1.98	Exwell Park ..	..	0.84
Cranemere ..	..	1.99	Seymour ..	..	1.55
Pearston ..	..	2.00	Glencairn ..	..	2.64
Somerset East ..	..	2.45	Port Alfred ..	..	1.71
Middleton ..	..	1.85	Hogsback ..	..	2.63
Middelwater ..	..	1.88	Thaba N'doda ..	..	1.73
			Peddie ..	..	0.88
			Cathcart ..	..	0.85
			Keiskama Hoek ..	..	1.41
			Forestbourne ..	..	1.65
			Thomas River ..	..	0.87
			King William's Town ..	..	0.60
			Do Hospital ..	..	0.72
			Stutterheim (Besté) ..	..	0.93
			Lynedoch ..	..	1.35
			Crawley ..	..	0.71
			Blaney ..	..	0.75
			Evelyn Valley ..	..	5.17
			Isidenge ..	..	1.94
			Perie Forest ..	..	1.52
			Quacu Forest ..	..	1.24
			Kologha ..	..	1.45
			East London, West ..	..	1.41
			Fountain Head ..	..	1.34
			Bolo ..	..	0.93
			Komgha (Gaol) ..	..	1.24
			Cata ..	..	1.97
			Wolf Ridge ..	..	1.72
			Dontsah ..	..	2.14
			Mount Coke ..	..	0.70
			Albert Vale (near Bedford) ..	..	1.13
VIII. NORTHERN KAROO:					
Calvinia ..	..	0.44			
Sutherland ..	..	0.79			
Fraserburg ..	..	0.27			
Carnarvon ..	..	0.63			
Wildebessetkooij ..	..	1.93			
Brakfontein ..	..	2.04			
Victoria West ..	..	2.84			
Britstown ..	..	1.81			
Murraysburg ..	..	2.45			
De Kruis ..	..	2.87			
Richmond ..	..	2.81			
Droogfontein ..	..	0.00			
Maraisburg ..	..	0.34			
Waverley ..	..	0.87			
Schuilhoek ..	..	0.85			
Zwavelfontein ..	..	1.61			
Petrusville ..	..	0.96			
The Willows (Middelburg)	..	0.84			
Middelburg ..	..	0.43			
Colesberg ..	..	1.13			
Steynsburg ..	..	0.70			
Arundel (Colesberg) ..	..	0.77			
Tarkastad ..	..	0.85			
Drummond Park ..	..	0.81			
The Meadows (Schoombie)	..	0.24			
Omdraais Vlei ..	..	1.60			
Varken's Kop ..	..	0.34			
Doorskuilen ..	..	1.68			

XI. NORTH-EAST :

INCHES

Mooifontein	1.40
Venterstad	0.78
Ellesmere	0.82
Lyndene	1.24
Halseton	1.44
Blikana	0.82
Molteno Station	1.09
Thibet Park	0.91
Sterkstroom	1.63
Rocklands	0.70
Aliwal North (Gaol)	1.25
Do (Brown)	1.39
Rietfontein	2.55
Carnarvon Farm	1.51
Jamestown	1.88
Queenstown (Gaol)	1.10
Do (D. E.'s Office)	1.32
Dordrecht	1.40
Tylden	1.32
Herschel	1.31
Lady Grey	1.31
Bolotwa, Contest	0.78
Lady Frere	1.15
Rhodes	1.29
Keilands	0.98
Barkly East	1.47
Cathcart (Queenstown)	0.81
Bensonvale Inst. (Herschel)	1.06
Glen Wallace	1.45
Indwe	1.14
Hughenden	0.54
Whittlesea	0.94
Albert Junction	1.12

XII. KAFFRARIA :

Ida, Xalanga	1.14
Cofimvaba	0.95
Nqamakwe	1.09
Main	1.37
Engcobo	1.89
Butterworth	1.26
Kentani	1.04
Maclear	1.32
Idutywa	0.30

XII. KAFFRARIA :—*Continued*

INCHES

Willowvale	0.69
Mount Fletcher	0.67
Elliotdale	1.46
Mqanduli	1.23
Flagstaff	1.41
Umtata	1.28
Kokstad (The Willows)	2.19
Kokstad	1.44
Port St. John's	1.71
Mandileni	1.50
Somerville (Div. Tsolo)	1.62
Tsomo	0.75
Bazeya	1.62
Insikeni	2.01

XIII. BASUTOLAND :

Mafeteng	0.69
Mohalie's Hoek	0.96
Qacha's Nek	0.57
Teyateyaneng	0.60
Leribe	0.76
Maseru	1.00

XIV. ORANGE RIVER COLONY :

Kroonstad	0.14
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XV. NATAL :

Durban, Observatory	1.76
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XVII. BECHUANALAND :

Vryburg	0.04
Taungs	0.14
Setlagoli	0.00
Kuruman	0.90

XVIII. RHODESIA :

Hope Fountain	1.19
The Range	0.00

CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 23rd June 1906, ruling at the several centres named, is published for general information:—

CENTRE.	A Wheat per 100 lb.	B. Wheat Flour. per 100 lb.	C. Roe Meal per 100 lb.	D. Mealies per 100 lb.	E. Mealie Meal per 100 lb.	F. Barley per 100 lb.	G. Oats per 100 lb.	H. Oat-hay per 100 lb.	J. Potatoes per 100 lbs.	K. Tobacco (Boer Roll) per lb.	L. Beef per lb.	Mutton per lb.	N. Fresh Butter per lb.	O. Eggs per doz.	P. Cattle (Slaughter) 4	Q. Sheep (Slaughter)
Allwal North	£ s. d. 0 0 0	£ s. d. 0 18 6	£ s. d. 0 14 0	£ s. d. 0 7 6	£ s. d. 0 6 0	£ s. d. 8 6	£ s. d. 10 0	£ s. d. 0 5 0	£ s. d. 0 5 6	£ s. d. 1/6 to 4/	£ s. d. 3d to 8d	£ s. d. 3d to 8d	£ s. d. 0 1 3	£ s. d. 2 6	£11 to £12	20/-
Beaufort West	0 12 6	0 17 0	0 12 6	0 10 0	0 12 0	10 6	10 0	0 7 6	0 9 0	0 4 0	3d to 1s	3d to 1s	0 1 9	2 6	£15	23/6
Burgersdorp	0 9 3	0 13 3	0 10 3	0 7 0	0 8 0	8 6	8 4	4/9 to 5/	0 4 6	3d to 7d	3d to 1s	3d to 1s	0 1 6	0	£16 to £20	25/-
Cape Town	11/- to 12/-	1 0 0	12/- to 13/-	0 8 9	0 8 0	8 0	8 0	...	0 12 0	0 1 0	0 8	0 7	0 1 5	1/3 to 2/4	...	...
Clanwilliam	0 11 0	...	...	0 7 6	...	...	...	0 6 6	0 12 6	0 0 0	...	...	0 1 3	1/3 to 2/4	...	...
Colaberg	0 8 9	0 13 6	0 10 6	0 7 9	0 10 6	6 0	6 0	0 3 6	0 5 0	0 1 0	0 5	0 7	0 1 3	1/3 to 2/4	£10	20/-
Oradeck	0 8 0	0 13 6	0 10 6	0 7 0	0 9 0	5 6	7 6	0 3 6	0 5 9	0 1 0	0 5	0 7	0 1 3	1/3 to 2/4	£22	35/-
Northrecht	0 12 0	0 12 0	0 11 0	0 5 9	0 9 0	5 6	7 6	0 3 6	0 6 6	0 1 0	0 5	0 7	0 1 3	1/3 to 2/4	£8	18/-
East London	0 10 0	...	0 12 0	0 7 0	...	5 0	7 6	0 3 6	0 9 0	0 0 0	0 5	0 7	0 1 3	1/3 to 2/4	...	...
Grass-Reinet	0 8 0	...	...	0 8 0	...	5 0	7 6	0 3 6	0 14 6	0 0 0	0 5	0 7	0 1 3	1/3 to 2/4	...	...
Graham's Town	0 10 6	0 15 0	0 13 0	0 6 6	0 9 0	6 9	10 0	0 3 0	0 6 6	0 0 0	0 5	0 7	0 1 3	1/3 to 2/4	£10 10s to £11	18/- to 20/-
Kimberley	0 8 6	0 14 6	0 12 0	0 6 0	0 7 0	4 0	10 0	0 3 0	0 6 6	0 0 0	0 5	0 7	0 1 3	1/3 to 2/4	£12 10s	23/6
King Wm's Town	0 8 9	0 13 6	0 10 6	0 8 6	...	9 0	10 6	0 3 0	0 11 0	0 1 0	0 5	0 7	0 1 3	1/3 to 2/4	£14	...
Malmesbury	0 10 0	0 15 0	0 13 0	0 16 0	...	4 0	10 6	0 3 0	0 11 0	0 1 0	0 5	0 7	0 1 3	1/3 to 2/4	...	...
Mossel Bay	0 10 6	0 15 0	0 13 0	0 16 0	0 15 0	6 0	8 0	0 3 0	0 11 0	0 1 0	0 5	0 7	0 1 3	1/3 to 2/4	...	...
Port Alfred	...	...	0 15 0	0 10 0	0 15 0	6 0	8 0	0 3 0	0 11 0	0 1 0	0 5	0 7	0 1 3	1/3 to 2/4	...	...
Port Elizabeth	...	...	0 15 0	0 10 0	0 15 0	6 0	8 0	0 3 0	0 11 0	0 1 0	0 5	0 7	0 1 3	1/3 to 2/4	...	...
Queen's Town	0 6 6	0 11 6	0 5 9	0 6 0	0 6 3	5 0	5 6	0 4 0	0 12 0	0 0 0	0 5	0 7	0 1 3	1/3 to 2/4	£10 13s	22/- to 23/-
Tarkastad	0 9 6	0 13 6	0 11 6	0 9 0	0 12 11	7 6	8 6	0 4 0	0 12 0	0 0 0	0 5	0 7	0 1 3	1/3 to 2/4	£12	20/-
Vryburg	0 11 6	0 18 0	0 14 3	0 7 6	0 9 0	8 0	10 0	0 4 0	0 16 0	0 0 0	0 5	0 7	0 1 3	1/3 to 2/4	£13	18/-
Worcester	0 9 6	0 13 6	0 10 0	0 7 6	0 8 6	8 0	8 6	0 4 6	0 16 0	0 0 0	0 5	0 7	0 1 3	1/3 to 2/4	£10 to £15	20/- to 25/-

† Imported.

* Colonial.

Norm.—A blank space denotes "no transactions."

DEPARTMENTAL NOTICES.

African Coast Fever.

Cattle from Natal Prohibited.

By Proclamation No. 182, dated June 11th, 1906, it is notified that whereas the disease known as African Coast Fever exists amongst cattle in the Colony of Natal, it shall not be lawful, from and after the date of promulgation hereof, to introduce or cause or allow any Cattle to be introduced from the said Colony of Natal into this Colony.

Any person who shall introduce such Cattle or cause or allow such Cattle to be introduced, or permit such Cattle to stray into this Colony from Natal shall be deemed to be guilty of contravening the provisions of this Proclamation, and shall be liable to the penalties provided for such contravention by the Animals Diseases Act No. 27 of 1893; and all such cattle as may enter this Colony from Natal in contravention of this Proclamation shall be liable to be destroyed.

Every Resident Magistrate, Field-cornet, Justice of the Peace and Inspector of Native Locations is strictly charged to see that this Proclamation is obeyed, and to bring to justice any person who may contravene the same.

Prohibition of the Importation of Cattle from Mauritius and India.

By Proclamation No. 164, dated May 21st, 1906, it is notified that whereas it has been made to appear that a disease amongst animals, known as "Surra," exists in the Island of Mauritius, and is endemic in certain parts of India:

And whereas it is deemed expedient to prohibit and regulate the importation of all Live-stock into this Colony from the Island of Mauritius and India by reason of the existence in those countries of the said disease:

Therefore, under and by virtue of the powers and authorities vested in His Excellency the Governor, by the provisions of Act No. 27 of 1893, intituled "The Animal Diseases Act, 1893," it is proclaimed and made known that it shall not be lawful, from and after the date hereof, to introduce into this Colony any Live-stock imported, whether directly or indirectly, from the Island of Mauritius and India:

Provided, however, that, notwithstanding the foregoing prohibition, it shall be lawful to introduce healthy animals from India into this Colony, provided they are accompanied by a certificate, to be signed and issued immediately before embarkation by a Veterinary Officer specially authorised to perform the duty by the Government of India, to the effect that such animals are free from disease, and have not come from a locality in which the disease known as "Surra" is endemic, and in which healthy cattle from non-infected areas are liable to become infected with the said disease, and provided further that such animals shall, on arrival at the Port of destination, be liable to quarantine at such place and for such time as may in each case be directed by the Chief Veterinary Surgeon of this Colony, and to such further conditions as to him may seem necessary:

Further, that any such Live-stock introduced into this Colony in contravention of this Proclamation shall be liable to be summarily destroyed, and any importer or

agent contravening any of these Regulations shall be liable to the penalty provided in Section 14 of Act No. 27 of 1893, that is to say, a fine not exceeding fifty pounds sterling or, in default of payment, to imprisonment with or without hard labour for any period not exceeding three months, unless such fine be sooner paid.

Nothing in this Proclamation contained shall be deemed to affect the validity of the prohibition on the landing or transshipping of livestock at any port on the East African Coast north of Durban, Natal, imposed by Proclamation No. 405, bearing date the 13th day of November, 1905, which shall be read and construed as one with this Proclamation.

Cattle and Ostrich Dips Free on Rail.

It is notified for general information that the undermentioned Cattle and Ostrich Dips will be carried free on the Cape Government Railways and by road to *bona fide* stock farmers who purchase them for their own use, subject to the conditions specified in the subjoined Schedule.

Government Notice No. 883, dated 21st August, 1905, is cancelled.

SCHEDULE OF CONDITIONS.

1. The Dip must be carried from the nearest Railway Station or Port, as the case may be, or otherwise by the usual trade route serving the locality in which the purchaser resides.

2. The Railage and road carriage, the cost of which will be borne by the Government, will be for the *forward* journey only, *i.e.*, from the nearest Railway Station or Port, or the usual trade route, as the case may be, to the purchaser's farm. No cost of the *return* journey or any part of it will be borne by the Government.

3. On delivery to the Civil Commissioner of the Division of the Railway consignment note or the receipt for transport or both, and on presentation to him of the seller's invoice or receipt for any of the undermentioned Dips, a refund will be made to the consignee of the railway or transport charges, or both, paid by him.

4. The Railway charges to be refunded will be at the third class rate.

5. The transport charges shall not be exceed those usually made to the general public.

6. The following Cattle and Ostrich Dips have been accepted as effective Tick-destroying preparations for the purpose, and within the meaning of these Regulations, and no other Dip will be recognised as an effective Tick-destroying preparation until a sample is supplied for analysis and a test of its practical efficacy has been made in the presence and to the satisfaction of a Government Veterinary Surgeon, viz. :—

Alderson's Cattle Dip.

Cooper's Cattle Tick Dip.

Demuth's Cattle Dip.

Fletcher's Albany Tick Dip.

Hayward's Sulphur Paste Dip.

Little's Cattle Tick Dip.

Quibell's Paste Cattle Dip.

Application for the Services of Government Veterinary Surgeons.

It is hereby notified that as there are now several qualified Veterinary Surgeons in private practice at Cape Town and its vicinity, Kimberley and Port Elizabeth, the services of Government Veterinary Surgeons in these places will be available only in cases where an animal is suffering from contagious or infectious diseases, or in cases which are, on other grounds, of public interest and importance.

Farmers and owners of stock throughout the Colony frequently telegraph for one of the Government Veterinary Surgeons to be sent to attend to some valuable animal which has been taken seriously ill. It is rarely possible to comply with these requests at once; in the first place, because it is seldom that the Veterinary Officers can be communicated with immediately by telegraph, as they are generally engaged in the country at some distance from a telegraph station; and in the second place, because the only Veterinary Officer who may be at liberty to leave the work upon which he is engaged at the time may be at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any real service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the Veterinary Staff discredited. It would be much more satisfactory therefore in all cases in which veterinary advice and assistance are required, if the owner would telegraph to "Veterinus," Cape Town, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This would enable the Chief Veterinary Surgeon to telegraph advice at once, and state whether he were able to arrange for veterinary attendance on the case or not, and thereby save valuable time, which is always of importance in acute and urgent cases.

It must, however, be clearly understood that, as this arrangement is intended purely for the benefit of farmers, the Government cannot accept any responsibility whatever, pecuniary or otherwise, for any loss of stock, etc., which may result from the treatment or advice of any Government Veterinary Surgeon.

Applicants for the services of the Government Veterinary Surgeons must, at their own cost, provide the necessary transport for the conveyance of these Officers from and back to their residence or nearest Railway or Post Cart Station.

D. HUTCHEON,
Chief Veterinary Surgeon.

Veterinary Branch,
Department of Agriculture, 24th September, 1905.

List of Cape Government Veterinary Surgeons.

Stations.	Names.
Cape Town	Mr. J. H. L. LYONS, M.R.C.V.S.
Cape Town	Mr. C. GOUNDRY, M.R.C.V.S.
East London	Mr. R. W. DIXON, M.R.C.V.S.
Elsenburg (Mulder's Vlei)	Mr. R. PAYNE, M.R.C.V.S.
Grahamstown	Mr. T. BOWHILL, M.R.C.V.S.
Grahamstown	Mr. J. SPREULL, M.R.C.V.S.
Kokstad	Mr. M. A. HUTCHENCE, M.R.C.V.S.
Mossel Bay	Mr. J. A. ROBINSON, M.R.C.V.S.
Molteno	Mr. W. G. PAKEMAN, M.R.C.V.S.
Oudtshoorn	Mr. S. ELLY, M.R.C.V.S.
Somerset East	Mr. J. D. BORTHWICK, M.R.C.V.S.
Uitenhage	Mr. G. W. FREER, M.R.C.V.S.
Umtata	Mr. P. X. KEARNEY, M.R.C.V.S.
Vryburg	Mr. J. NEILL, M.R.C.V.S.
Worcester	Mr. A. GOODALL, M.R.C.V.S.

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town. Members of Farmers' and Fruit Growers' Associations applying for same through the Secretaries of these Associations are supplied free of charge.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V of *Agricultural Journal*.

Artificial Grasses and Fodder for Stock; Ensilage; Treatment of Cereal and other Crops; Viticulture and Wine Making; Forestry; Locusts and their Destruction; Possible New Industries for Cape Farmers; Stock Farming; Dairying.

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Agricultural Weather Forecasts (1d.); *Brak Land in Relation to Irrigation and Drainage (1d.); *Poultry Raising (1d.); The Velvet Bean (1d.); Potato Disease (1d.): Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Grasses for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d.); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (3d.); The Salt Bushes (1d.); Tobacco Culture by P. Bornemisza (1d.); The Cultivation of Tobacco in the Colony by K. Schenck (3d.); Tobacco Wilt in Kat River Valley (1d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d.); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); *Butter and Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Cabbage Aphis (1d.); Codling Moth in Madeira Fruit (1d.); *Codling Moth (1d.); Fruit Fly (1d.); Fumigation Supplies (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d.); *Peach Yellow (1d.); Pear Slug, Paris Green (1d.); Remedy for Mezwurmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.); Scale Insects on Ornamental Trees and Plants (1d.); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d.); Fumigation under Box Covers (1d.); The House Fly (1d.); New Oak Tree Pest (1d.); Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.); Another Introduced Scale Pest (1d.); Washes for Red Scale (1d.); Fruit Fly: Peach Fly (1d.); Lime-Sulphur-Salt Wash for Scale Insect (1d.); Cyanide Gas Fumigation (1d.); The Fruit Moth (1d.); Fusicladium of the Apple and Pear (1d.); Mealie Stalk Borer (3d.)—coloured plate: Cleaning up Nursery (1d.); Natural Enemies of the Fruit Fly: Report on Investigations in Brazil (1d.); Locust Birds and Locust Poison (1); The Brazil Fruit Fly Parasites (1d.); Cyanide Gas Remedy for Scale Insects (3d.)

Forestry.

British National Forestry (1d.); Botanical Observations on Forests in Eastern Pondoland (1d.); †Elementary Principles of Sylviculture or Woodcraft (1d.). National Forests (1d.); Indigenous Timbers of the Cape (1d.); Misuse of Coal and the Uses of Forests (1d.); Tree Planting for Timber and Fuel (1d.); Tree Planting for Farmers (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Fisheries.

Trout and Carp Breeding and Stocking of Streams (1d.); *Methods of Preserving Fish by Smoking (1d.); Portable Floating Hatching Box for Trout Ova (1d.)
The Protection of Trout (1d.)

Horticulture

Fruit Culture in the Gamtoos River Valley (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (6d.); The Olive at the Cape (2d); Tomatoes and Fruit for Export (1d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.); *Fruit from Orchard to Buyer (1d.)
Netting for Fruit Trees (1d.); Fruit Culture in Argentina (1d.); Vegetables for Exhibition (1d.) Chrysanthemum Rust (1d.)

Veterinary and Animal Industry,

*Anthrax, Charbon, Miltzbrand or Miltziekte (1d.); *Heartwater (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d.); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstock's Report on Inoculation for Rinderpest (1d.); *Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.); *Sheep and Wool (1d.); The Eye and its Diseases (1d.); Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhœa in Calves (1d.); Persian Sheep and Heartwater (1d.); Poisoning of Stock (1d.); Retention of the Fœtal Membrane, or Afterbirth in Cows (1d.); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Transmission of African Coast Fever (3d.); Tuberculosis and the Use of Tuberculin (1d.); African Coast Fever with Description of Dipping Tank (3d.); *Rinderpest in South Africa (3d) by D. Hutcheon; *Fluke or Slak in Liver of Sheep (3d.)—*coloured plate*; *Anthrax or Miltziekte and Quarter Evil or Sponsziekte (1d.); Osteo Porosis (3d.)—*coloured plates*; *Glanders (3d.)—*coloured plate*; *Animal Castration (1d.); *Preventive Inoculation for Redwater (1d.); *Abortion in Cattle (1d.); Treatment for Worms in Domestic Animals (1d.); *Lungsickness of Cattle, Contagious Pleuro-Pneumonia, or Pleuro-Pneumonia-Bovum-Contagiosa (1d.); *Swine Fever, Hog Cholera or Pig Typhoid (3d.)—*coloured plates*; Castration of Females and Animals other than the Horse (1d.); Poisoning of Horses by *Ornithogalum Thyrsoides* or Chinkerinchee (*coloured plate*) (3d.); Diseases of the Horse and their Treatment (1s.); Horse Sickness by D. Hutcheon (2d.); Ticks and African Coast Fever (1d.); Cirrhosis of the Liver in Stock (1d.); Liver Disease among Calves (3d.); The Arsenite of Soda Dipping Mixture (1d.)

Viticulture.

†Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d.); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d.); Manufacture of Dry Wines in Hot Countries (3d.)

Miscellaneous.

Game Seasons (3d.); Land Laws of Cape Colony (1d.); †Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c. (1d.); Transvaal Plant Import Regulations (1d.) Bars in Ostrich Feathers (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

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(One Door above Loop Street.)

THE PRODUCE MARKET.

CAPE TOWN.

Mr. R. Müller, of Strand Street, reports for the month ending June 20th:—

Ostrich Feathers.—At the London Feather Sales, which opened on the 14th of June, prices generally were ten per cent. lower, with the exception of Spadonas, which were firm; while Blacks and Drabs remained unchanged. There was no recovery at the close of the Sales, and the fall on Wings was even more than ten per cent., especially in the case of Seconds and Thirds.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
Super Primes	10	0	0	35	0	0	Floss ..	0	5	0	1	10	0
Firsts, Ordinary							Long Drabs ..	2	10	0	4	10	0
to Super ..	8	0	0	10	0	0	Medium Drabs..	1	5	0	2	0	0
Seconds ..	5	0	0	7	10	0	Short to Medium	0	10	0	1	10	0
Thirds ..	3	10	0	4	10	0	Floss ..	0	2	6	1	10	0
Femina (super)	7	10	0	9	10	0	White Tails ..	1	15	0	3	0	0
Femina, Seconds							Coloured Tails..	0	10	0	1	15	0
to Firsts ..	4	0	0	6	10	0	Chicks ..	0	1	0	0	2	0
Byocks (fancy) ..	5	0	0	7	10	0	Spadonas ..	2	10	0	4	0	0
Long Blacks ..	4	10	0	7	10	0	Inferior Black &						
Medium Blacks	3	0	0	3	10	0	Drabs, Short						
Short to Medium	0	10	0	2	10	0	to Long ..	0	0	6	1	10	0

Wool.—The Market remains unchanged for good quality Combing Wools, while inferior and wasty lots are easier. The quantity offered is not very large, the season being practically over. Short Wools and Lambs of light condition are taken for washing, and prices for these are unchanged. Advice from Europe report that the Wool Trade is in a healthier condition, and it is expected that good quality Long Wools will remain firm.

	s.	d.	s.	d.		s.	d.	s.	d.
Super Long Grass Veld					Short and Inferior	0	4	0	5½
Wool ..	0	8	0	10	Wool for Washing	0	4½	0	6½
Super Long Karoo Veld					Snow-white Super to Extra	1	7	1	11
Wool ..	0	6½	0	8	Ordinary	1	2	1	7
Medium Karoo Veld Wool	0	5	0	6½	Fleece Washed	0	9	0	10

Mohair.—Consignments from the country are coming in freely, and there is no difficulty in placing fair to good quality clips at full rates. Super Kids realising up to 1s. 7d., Super Firsts up to 15½d. Ordinary Kids 1s. 4d. to 1s. 6d.; ordinary Firsts from 1s. 0½d. to 1s. 3d. Mixed parcels from 11d. to 1s. 1d.

	s.	d.	s.	d.		s.	d.	s.	d.
Mohair, Firsts, Summer	1	1	1	3½	Mohair Winter	0	10½	1	0½
Kids ..	1	3	1	7	Kids ..	1	0	1	3
Seconds	0	6½	0	9½					

Skins and Hides.—The Market is steady, all classes are in good demand.

PORT ELIZABETH.

Messrs. John Daverin and Co., report under date June 15:—

Ostrich Feathers.—There was a full three days' sale held this week. On Monday the market opened very weak, and all descriptions of Whites, Feminas, and Tails were quite 10 per cent. lower, Blacks and Drabs shewing little change. On Tuesday and Wednesday the market became more steady, and Whites and Feminas shewed some improvement compared with Monday's prices. Tails continued weak, Blacks and Drabs remaining unchanged. There has been no business done out of hand, buyers' offers being quite 10 per cent. below what they were prepared to pay two weeks ago. The total quantity sold on our public market this week amounted to £10,731 19s. 5d., and weighed 4,391 lbs. 11½ ozs.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
Primes: Extra super				Special Prices.			Feminas:						
Good to super	9	0	0	12	0	0	Seconds ..	3	10	0	5	0	0
Whites: Firsts	7	0	0	9	0	0	Thirds ..	2	0	0	3	0	0
Seconds ..	5	0	0	7	0	0	Greys ..	4	10	0	6	10	0
Thirds ..	3	0	0	4	10	0	Fancy ..	4	10	0	7	0	0
Feminas:							Tails' White	1	7	6	3	0	0
Tipped (Firsts)	5	0	0	8	0	0	Light ..	0	17	6	1	15	0
							Coloured & Dark	0	5	0	0	17	6

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
Blacks : Long ..	2 10 0	4 0 0	Drabs :		
Medium ..	1 0 0	2 5 0	Short ..	0 2 6	0 6 0
Short ..	0 10 0	0 15 0	Wirey ..	0 0 6	0 1 0
Wirey ..	0 1 0	0 1 6	Floss ..	0 6 0	1 5 0
Floss ..	0 6 0	1 5 0	Spadonas : Light	2 0 0	4 0 0
Drabs : Long ..	1 5 0	2 15 0	Dark ..	0 12 6	1 15 0
Medium ..	0 12 6	1 0 0	Chicks ..	0 0 3	0 1 6

Wool.—This market remains very quiet, and the amount of business done in the open market has been very small, buyers showing no disposition to operate, except at prices that sellers cannot entertain.

Snowwhite Extra			Grease, Short, faulty and wasty ..	5d	5½d
Superior ..	20d	20½d	Grease, Coarse and Coloured ..	5½d	5¾d
Snowwhite Superior ..	18d	19½d	Scoured, Coarse and Coloured ..	6½d	10½d
Do Good to Superior	17d	17½d	Basuto Grease, short..	7d	7d
Do Inferior Faulty	16½d	17d	O. R. C. Grassveld Grease, long and well - conditioned (special clips) ..	7d	7½d
Grease, Super Long, well-conditioned, Grassveld grown (special clips) ..	9d	10d	O. R. C. Grassveld Grease, long and well-conditioned ..	6½d	6¾d
Grease, Super Long, well-conditioned, Grassveld grown ..	7d	8d	O.R.C. medium grown, light, with little fault ..	6½d	7½d
Grease, Super Long, well-conditioned, Karoo grown (special clips)	7d	7½d	O.R.C. short, faulty and wasty ..	5d	5½d
Grease, Super Long, well - conditioned Karoo grown ..	6½d	7d	O.R.C. Karoo grown, long and well-conditioned ..	6½d	6¾d
Grease, Super Long, well - conditioned, Mixed Veld ..	6½d	7d	O.R.C. medium grown, light, with little fault ..	5½d	6½d
Grease, Light, faultless, medium, Grassveld grown ..	6d	7d	O.R.C. short, faulty and wasty ..	5d	5½d
Grease, Light, faultless, medium Karoo grown ..	6d	6½d			
Grease, Light, faultless, short Karoo grown	6d	6d			

Mohair.—This market continues very firm, and a large business has been done in the open market during the week at full prices, our sales of 600 bales being the most important. Amongst the parcels we sold were some very fine clips, namely, one of 50 bales belonging to the estate of the late P. H. Gericke. This clip consisted of 8 bales Kids, 10 bales Firsts, 3 bales Rams, 4 bales Seconds, and 1 bale Locks. The Hair was well grown, of bright lustre, good quality, and was very carefully got up. It was much admired by all those interested in the trade. We also disposed of some other fine clips grown by Mr. L. Gardiner, Mr. T. J. C. Foxcroft, Mr. H. Foxcroft, Messrs. I. & W. Gardiner, Mr. T. J. Ferreira, &c., all of which were much admired by buyers. The season is now in full swing; arrivals continue large, and we are pleased to be able to report that sales are readily made at full current prices. On the public market on Tuesday a fair quantity was offered, prices shewing no change.

Super Kids ..	1s 7d	Mixed O.R.C. Hair (average) ..	0s 11½d	1s 0½d
Ordinary Kids ..	1s 4d	Very Mixed O.R.C. Hair (average) ..	0s 10½d	0s 11d
Superior Firsts, special clips ..	1s 3½d	Seconds and Grey ..	0s 8d	0s 9d
Ordinary Firsts ..	1s 3½d	Thirds ..	0s 6½d	0s 7d
Short Firsts ..	1s 1d	Winter ..	none offering.	
Superfine Long Blue, O.R.C. Hair ..	1s 2½d	Do. Kids ..	do.	

Skins.—Sheepskins sold in bundles at 7½d. per lb.; Pelts at 6½d.; Capes, 2s. 3d.; damaged, 8d. each; Angoras, 8½d.; Shorn, 6d.; damaged, 4½d.; Goat, 12½d.; damaged, 6½d. per lb.; Springbok, 9d. each.

Hides.—Sundried Hides sold this week at 7½d., and for damaged 5½d.; Drysalted, 6½d.; damaged, 5½d., and Thirds 3½d.

THE Agricultural Journal

OF THE CAPE OF GOOD HOPE.

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All communications should be addressed :

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NOTES.

Colonial Dried Fruits in London.

The Department of Agriculture has been advised that the Judges at the Colonial Fruit Show, held in London by the Royal Horticultural Society on the 9th and 10th June last, have awarded a Silver Banksian Medal to each of the four exhibitors of Colonial Dried Fruits, viz., to :—

Mr. E. T. L. Edmeades, Oudtshoorn,	for Walnuts ;
Mr. H. L. Potgieter, Oudtshoorn,	for Almonds ;
Mr. J. P. Hamman, Worcester,	for Sultanas ; and
Mr. A. P. Hamman, Worcester,	for Stalk Raisins,
	Loose Raisins, and
	Currants.

The Sultanas were declared by the Judges to be the finest of their kind, while the raisins were highly approved of on account of their excellent flavour. There is said to be a good market for Colonial Walnuts, owing to the fact that those at present for sale in London are either Kiln or Sulphur-dried, whereas the walnuts of Mr. Edmeades are sun-dried, and on that account sweeter and of a better flavour.

Swabbing Vines for Anthracnose.

Messrs. Pfeiffer & Pfeiffer of Timour Hall, Plumstead, Cape, have by special request kindly kept tally of their expenses in swabbing portions of their vineyards with the acid sulphate of iron solution recommended, in our last issue, for anthracnose, and have favoured us with the following figures :—

- (1) 1218 four year old Hermitage and Muscadel ordinary sticks :

	$\left. \begin{array}{l} \text{Sulphate 112 lbs.} \\ \text{Acid 1 quart} \\ \text{Water 22 gal.} \end{array} \right\}$	$\begin{array}{r} \text{s.} \quad \text{d.} \\ 11 \quad 7 \end{array}$
Labour...	...	... 4 10
		16 5

equivalent to about 13s. 6d. per thousand sticks.

- (2) 765 five year old Barbarossa vines of 3 feet 6 in. trellis :

	$\left. \begin{array}{l} \text{Sulphate 112 lbs.} \\ \text{Acid 1 quart} \\ \text{Water 22 gal.} \end{array} \right\}$	$\begin{array}{r} \text{s.} \quad \text{d.} \\ 11 \quad 7 \end{array}$
Labour...	...	... 8 0
		19 7

equivalent to about £1 5s. 8d. per thousand vines.

(3) 300 seven year old Raisin Blanc vines on 5 feet trellis :

		s.	d.
Solution	...	9	9
Labour	...	8	10

18 7

equivalent to $\frac{3}{4}$ d. per vine or about £3 2s. per thousand.

(4) 357 twenty year old Raisin Blanc ordinary sticks :

Solution	{ Sulphate 112 lbs. }	s.	d.
	{ Acid 1 quart }	11	7
	{ Water 22 gal. }		
Labour	...	5	1

16 8

equivalent to about £2 6s. 8d. per thousand.

The sulphate of iron and sulphuric acid were purchased in Cape Town, the former at £9 10s. per ton and the latter at £2 5s. per case of four 42 lb. jars. One jar of Acid suffices for about 1,000 lbs. of Sulphate. The men were paid 3s. 3d. per day and were not housed, fed, or given wine. The cost of clearing the soil from about the vines was not ascertained and is not considered in the calculations. The work was done with specially made brushes measuring about one inch by two inches where bound, and with fibres about six inches in length; they wore well and are considered vastly superior to rag swabs. Messrs. Pfeiffer & Pfeiffer are prepared to supply similar brushes at 9s. a dozen. Paraffin tins proved serviceable for carrying the solution; though attacked to some extent, they did not leak after ten days' use. Galvanised iron buckets were tried, but by the eighth day they had holes corroded through them. The vines were cleaned out before they were swabbed but were not pruned; the shoots to be left were treated to a little beyond where they will be cut off. It was found that with care very little of the solution need get on the trellis wires.

Red Scale Parasite.

Mr. George Compere, the Government Entomologist of West Australia and a man who has become of world-wide reputation because of his labours in seeking natural enemies for the Fruit Fly, Codling Moth, Red Scale, and other notorious insect pests, has written to the Government Entomologist as follows under date May 7th:—"The Red Scale parasites which I sent to California and to this State last fall from China in cold storage were all frozen, but a lot which I brought in person and cared for during the trip turned out better. From fifteen living specimens which we liberated on a small orange tree well stocked with Red Scale in a

breeding cage in the office, and which was placed in an infested orchard about the first of December, we have them now by hundreds of thousands. Mr. Newman who has them in charge is sending them to all parts of the State in thousands; and the Chief Inspector, Mr. T. Hooper, has given orders that in future no spraying or fumigation be directed against the Red Scale in the State. I suggested to the Department that sendings be sent to you, and the first one will leave here per the "Sophocles" which is timed to leave for Cape Town on May 31st so you must be on the lookout for them".

The sending thus announced arrived here on June 23rd. It consisted of about eighteen scaly rough lemons and had been kept throughout the voyage in the cool chamber of the vessel. Nine of the fruits were suspended within a scale-ridden lemon tree, each fruit in a bag of mosquito netting and all hung close together; while the rest of the fruits were kept under observation at the office. With one exception the fruits have kept well, but up to the time of writing, four weeks from the arrival of the sending, not a single parasite has emerged from the fruits under observation, and it must be assumed that few or none can have gone from the fruits in the tree. The disappointment is great, and the arrival of further sendings is anxiously awaited. The West Australian Government has been asked to send us small trees as well as fruit; and if necessary trees infested with scale will be sent from the Cape, exposed to the parasite at Perth, and then returned to Cape Town. Several trees have been got in readiness.

Mr. Compere's courtesy in endeavouring to assist the Cape to get this parasite is sincerely appreciated. If the hopes which he raises are realized we will owe him a huge debt of gratitude, for the Red Scale is the most troublesome of the several fruit tree scale insects which have been introduced into South Africa. Until the success of the parasite here is assured, however, fruit growers should not count upon it but continue to spray and fumigate for the pest with unabated persistency. It is not known to us whether or not the present parasite is the species found by Mr. Compere in China a few years ago and which he succeeded in getting to California. The Californian authorities raised a promising colony and liberated it in an orchard. Unfortunately the orchard was cut out without warning shortly afterwards, and it is presumed that none of the parasites survived.

Tobacco Seed for Distribution.

In view of the frequent applications made to the Agricultural Department for superior tobacco seed a supply of six of the best sorts has been ordered from the United States which it is proposed

to distribute gratis to farmers in quantities sufficient to sow considerable areas. It is advisable to plant this seed well away from the common sorts in order to prevent in this respect contamination to the seed. American and Cape practice differ markedly and it must be admitted that in the art of tobacco culture the former country is far ahead of us. As explained in a short article in this issue dealing with this subject in America, the seed is sown very much more thinly than here, the aim being to produce sturdy robust plants capable of standing transplanting better and giving better leaves. Here we sow much more thickly and the result is delicate, drawn up and unbalanced plants. The varieties selected are those calculated to produce that warm yellow colour which is so much in demand, when properly cured especially when fine cured in barns. It may be mentioned that by this process of curing, tried experimentally in the Kat River area last season, leaf from our ordinary inferior tobacco, which cured in the ordinary way is worth sixpence half-penny a pound is now fetching one shilling. We have it on good authority that for this article there is practically an unlimited demand. We hope shortly to publish an account of these experiments together with a detailed explanation of the methods by which this desirable end may be attained. Meantime anyone desirous of trying these new varieties is requested to apply, describing accurately the nature of the soil to be planted, to the Agricultural Assistant. There is a small supply of Turkish seed available also. Only one variety will be supplied to each applicant.

Eatable Snails in Vineyards (*Escargots*)

In the article "More about Carp" appearing in this issue, is given a selection from the latest official returns of the price of Carp and other fish on the markets of France. To the stay-at-home Englishman one of the most curious items in this return of French food stuffs is *Escargots* which fetch up to 13s. 4d. the thousand. This is the large white eatable snail which tastes like an oyster in a paté and which most people who go to Paris eat and enjoy. It abounds in vineyards in France and is an important product. Count de Vasselot, the former head of the Cape Forest Department, used to say that the *Escargots* paid all the cost of cultivating his vineyards in France. I understand it does no harm to the vines. It may be an advantage in reducing the superabundant leafage and thus throwing the sap into the fruit. As an esteemed table delicacy and an important source of revenue the introduction of *Escargots* is at least worth the attention of Cape viticulturists.—D. E. Hutchins.

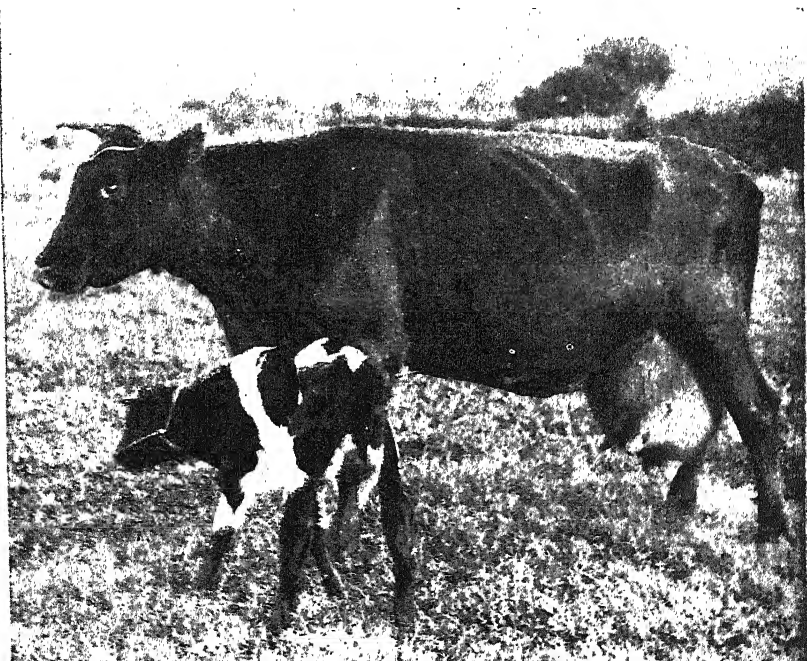
Shropshire Sheep in Rhodesia.

At the Salisbury Rhodesia Agricultural Show held in June, two Shropshire rams entered by Messrs. William Cooper and

Nephews (Cooper dip proprietors), Sandown Estate, near Bulawayo, succeeded in securing two first prizes, besides taking a special prize for the best ram on the show. The rams came from Messrs. Coopers' home flock, and were specially imported for a gentleman in the Untali district, and left for their new home after the show. The judges remarked that in their opinion the Shropshire breed was the most suitable for the country.

A Prolific Cow.

The illustration herewith shews a cow with a most remarkable record. She belongs to Mr. J. H. Le Roux, of Roodeheuvel, Oudtshoorn, she is now 24 to 25 years old and has produced exactly 20 calves in the course of her lifetime. The last one, shewn in the illustration was born towards the end of May. In her prime she gave as high as 62 bottles of milk per diem (say ten gallons), and had to be milked three times a day. She is constantly in milk and at present is giving about 30 bottles per diem. These data are vouched for by the owner. She is described as of doubtful breed showing signs of a strong strain of Shorthorn, with Friesland and Afrikander blood.



The Royal Agricultural Show, (England.)

Mr. R. Pell Edmonds, who is visiting England, sends the following notes on the Royal Show :—Perhaps a few notes about

this year's Royal Show from a Colonial point of view may prove of interest to my brother farmers. I was only able to attend the one day and there is so much to be seen that I do not think it could be done thoroughly by one person attending for the five days. On arriving I made for the cattle. The Shorthorns alone made a large show, but were all so fat that they could hardly walk. The Lincoln reds ranked next. There were not many Ayrshires and they were very different to those we see at Cape Town. They looked very delicate and the bulls had regular cows' heads and necks. The Kerries also seem to have been improved until it is hard to associate them with the description of the poor man's cow, The Longhorns made a very fine show and I was told that there is an increasing demand for bulls to cross with Shorthorn cows. There were not as many Welsh cattle shown as last year, but those that were there were excellent, and I was more than ever convinced that they are the cattle for South Africa. I attribute this partly to the fact that they have never been taken up as a fashionable breed, but have remained the rent producer of the Welsh farmer.

The Earl of Denbigh had a fine show of brown and rainbow trout in tanks containing fry, one, two and three years old and it was noticeable that the rainbow trout grow more rapidly than their brown brethren. There was also a fish called the golden carp which I was told grows to about five pounds and affords excellent sport, rising readily to fly, but is not of much table value.

But one of the most interesting exhibits to us who dwell in a land of wire fences was some newly tanned hides showing the damage done to the leather trade by barbed wire, the smooth surface of the leather looking as if it had been maliciously scored with a nail. There were also hides shown with as many as 250 holes in them caused by the warble fly.

There was also an exhibit of wheat and barley grown in pots to show the effects of too much and too little artificial manure, also one to show the bad effect of sowing seed in wet soil. In the course of conversation with the gentleman in charge I mentioned the bad effects of kraal manure on dry lands in a dry season. He expressed an opinion that if the manure was used as a mulch the crops would not burn. Among heavy horses the Suffolk Punches made a grand show and on asking a man why this noble and active breed are not more common on farms, I was informed that they become too heavy for their legs to stand their weight, I give this opinion for what it is worth.

Insufficient Address.

Will Mr. M. C. Jackson, Baltrasna, who wrote applying for a pamphlet on "Butter and Cheddar Cheese making" please forward his full postal address, as that sent is insufficient. Will correspondents again please note the absolute necessity of complying with this rule. Letters are frequently delayed, and answers rendered impossible sometimes, through these omissions.

A Veterinary Surgeon Dies of Glanders.

The *Veterinary News* of June 9 contains the following :—"We regret to announce the death of Mr. Walter Hill, of the Veterinary Division, Department of Agriculture, Orange River Colony, which took place on February 14, at Senekal in that Colony. His death was caused by acute septicæmia, after an illness lasting only five days. He had made a *post-mortem* on a glandered horse three or four days before his illness commenced, and there is no doubt he contracted the disease in that way. Mr. Hill had been for a considerable time in South Africa, but had only been in the department a few months at the time of his death. He was universally popular, and regarded as a sound professional man, conscientious and energetic." The dangers of glanders to human beings is becoming more and more marked, and every care should be exercised where this disease is suspected.

Wanted : Dried Locusts.

A correspondent still enquires for dried locusts put up in bags, and on the rail. Can no one offer to supply? It is a pity to allow a market to die for want of supplies when the commodity is to be had for the trapping.

Grapes for Export.

Mr. C. du P. Chiappini, who visited London in connection with the Horticultural Society's Show, in his report on the export fruit trade, says :—"The greatest care should be taken in the selection of the fruit. It cannot be too deeply impressed upon the exporters that in England fruit is sold almost entirely on its appearance. I frequently alluded to this when I had occasion to speak in public in England. A box of first-class Grapes would fetch 20s. in a fair market, whereas a box of slightly inferior Grapes would fetch 5s. in the same market, and if the fruit is a little bruised it is immediately put down under the heading of "Waste" and sold at 1s. 6d. or 2s. per box or less. The English taste is also much influenced by the colour of the fruit. I have often seen Grapes marked in

the shop window as follows:—White Hanepoot at 1s. 6d. per pound; Red Hanepoot at 2s. per pound, though the quality is exactly the same—for this reason, two colours of the same class of Grape or any other fruit should not be packed in the same box under any circumstances. Hanepoot is usually called “Cape Muscat” by fruit dealers.

The following is a list of varieties of grapes placed in accordance with the condition in which they arrive:—(1) Raisin Blanc, (2) Hanepoot, (3) Barbarossa, (4) Black Hamburg or Hermitage. I did not compare the Cape Spanish (or white Spanish) Grape, which has recently been exported to London from the Cape, with the above classes, though this Grape arrived in a good condition. I cannot see how it can compete with the real Spanish Almeria, which has a better appearance, has the same taste (which is very poor at its best), and is sent over from Spain in barrels (packed in cork dust which is used again), and is sold very cheaply, and will keep for a month or two months. The English are accustomed to buy Spanish Almeria for 3d. to 6d. per pound, and cannot be expected to pay more for the same Grape grown at the Cape. It would not pay to export at this price. I must, however, mention that I was informed that it is not likely that the Spanish Almeria will be on the London market next year.

From all sides I am advised that the thinning out of the bunches when the Grape is about half grown should be carefully gone into. The English people are not accustomed to see tightly grown bunches of grapes, with small, half-developed berries in the bunch. This question must be carefully considered.

FARM AND VELD.

Experimental Crops and Grasses.

We call attention to the report in another part of this issue on the results obtained by farmers in experiments with grasses carried on in all parts of the colony. This statement which is interesting and instructive reading, forms part of a series which will in time cover all the experiments with crops which the Agricultural Department is carrying on with the help of farmers—some twelve hundred in number—throughout the colony. Last month, sundry forage crops were discussed, this time grasses are dealt with, and in future issues we hope to take up successfully leguminous crops, millets and sorghums, mealies, cowpeas, bacterial fertiliser, cotton, tobacco, wheat, oats and barley. Farmers who are co-operating with the Department and who have received report forms to fill up on these and kindred subjects will greatly oblige by completing the same as the crops mature and forwarding them, in order that the results published in the *Agricultural Journal* may be as accurate and full as possible.

Fresh supplies of seed are constantly being procured and issued to all applicants willing to try them and report in due course, and this opportunity is again taken of inviting all interested to communicate on the subject with the Agricultural Assistant. The seed is put up in parcels of a few pounds and delivered free at the applicant's nearest station.

To those interested the following brief instructions on the crops mentioned last month and now may be of assistance.

Rape (*Brassica napus*).

A rapid growing forage plant of high feeding value and well suited for dairy cows, sheep and lambs, and ostriches. This crop may be sown on newly braaked lands or on old stubble lightly ploughed. Kraal or artificial manures help growth, but are not essential. The seed maybe sown so as to give a good succulent feed when other green food is scarce. Sow in March or April or again in August and September 12 to 16 pounds per morgen and harrow lightly in. Under irrigation, sown in drills, 18 to 24 inches apart using 8 to 10 pounds of seed per morgen. These varieties are available for distribution :—Summer, Winter and Essex, on the relative merits of which it is still desirable to obtain fuller information.

Thousand-headed Kale, (*Brassica oleracea*, var.)

Is recommended for trial to those who require a succulent green feed for dairy cattle either to be fed fresh or made into ensilage. It grows to a height of 3 feet or more and branching close to the ground gives a heavy crop of juicy green leaves. It withstands cold well, but is not suited to our drier regions. In the Western Province without irrigation April and August are the sowing months, preferably the former, while under irrigation August and September should be about right. It is best sown in drills 36 to 30 inches wide, using 12lbs of seed per morgen, or it may be treated like cabbages and planted out 30 inches apart which takes 15,000 plants per morgen. With stable or kraal manure or under irrigation Kale yields very heavy returns and three crops may be gathered from it in one season. The leaves may be plucked off from below upwards by degrees or the plant cut like cabbage a little way above ground. In either event a second crop may ordinarily be expected. Stable or kraal manure can be liberally applied; it will be well spent.

Mangold (*Beta vulgaris*),

Forms one of the best known and highly valued foods for cattle, sheep and pigs, especially if stable fed. It keeps well either in the ground or stored in a cool outhouse. It is usually sown in beds in March, April or May in the Western Province and planted out two to three months later in rows 28 to 30 inches apart and 8 to 10 inches in the rows. It may also be sown direct in drills and thinned out later. Mangold prefers stiff and fertile soils and is much benefitted by the free use of dung.

Sunflower (*Helianthus annuus*).

This may be regarded as a crop of limited use being chiefly valued as a poultry feed, also given to horse and sheep. The seed contains a valuable oil. Sunflowers are sown on land prepared as for mealies, and are sown in drills three and a half feet apart, using 20 to 30 pounds of seed per morgen and thinning out the plants when about 8 inches high, to a distance of from 18 to 35 inches apart. Sow earlier than is usual for mealies, and in harvesting gather and dry the whole heads.

Sugar Beet (*Beta vulgaris*, var.)

This crop is being tested, not only being valuable as a stock food, but on account of the possibility of its having a value as a source of sugar. It should be sown in drills direct on deeply tilled, well manured land, and when a few inches high, be thinned out to a distance of 7 or 8 inches between the plants. The ground requires

constant cultivation and each plant should be given the maximum space and sunlight in order that plenty of sugar may be prepared in the leaves and be stored up in the "bulb."

Rescue Grass. (*Bromus Schraderi*).

A most nutritious grass, suitable for grazing, hay or green forage, well known in the Colony under different names. This grass is proving itself the best winter grazing or the earliest green forage we can get. It should be sown in autumn either under rain or led water at the rate of 25 to 30 pounds per morgen. Where the rainfall is deficient, irrigation is necessary. It is not suited to dry or hard lands and the ground should be well prepared before sowing. It has given good results in the Eastern Province when sown about the middle of summer and about April or September in the West. The grass is naturally an annual, but if prevented from seeding it will survive several seasons. If allowed to seed it will re-sow itself naturally next season even if a different crop is taken off the land in the interval.

Awnless Brome Grass. (*Bromus inermis*).

A perennial grass growing on poorer soils, better suited for grazing than for hay. Sow in wet season at the rate of 20 pounds per acre on clean land, and harrow well in.

Golden Crown Grass, (*Paspalum dilatatum*).

A very valuable fodder grass, at the present time receiving a great deal of attention. It is particularly well suited for grazing horned stock but is useful for other purposes too. *Paspalum* grows best on a rich soil with abundance of water, but persists also on poor and dry situations. It often does well where lucerne will not answer. As the seed often germinates with difficulty, whereas the grass may be readily propagated from slips, farmers are advised to sow the seed plentifully say as thick as cabbage seed is sown, in garden beds or even in boxes. The seedlings may then be pricked out in well prepared ground in rows 3 feet wide and 2 feet apart in the rows. After six to nine months these plants, especially if irrigated, will form large tussocks which may be divided up and planted out wherever desired. Thereafter this process may be continued indefinitely while self-sowing will gradually increase the density of the crop. As might be expected it gives the best results under irrigation, but this is by no means essential. As the seed is put in a small area it may be sown at almost any season and planted out when the rains commence or irrigation is begun.

Cocksfoot Grass, (*Dactylis glomerata*)

Has already done well and is highly spoken of as a tall strong growing grass making excellent hay or grazing. It does best in regions of good rainfall and must be preserved from the too constant attention of stock until well established. Sow broadcast, 60 to 20 pounds per morgen on a finely prepared seed-bed at the same season as cereals, and cover over very lightly with a bush harrow.

Perennial Rye Grass, (*Lolium perenne*)

Is one of the finest hay and pasture grasses known. Sow broadcast on well prepared seed bed at the rate of 90 pounds per morgen on good moist soil on irrigable land, or in regions of ample rainfall.

Italian Rye Grass, (*Lolium italicum*).

A highly valued grass for hay, or all classes of pasture. If allowed to flower, it is annual, if not it may be made to last longer. It may be sown during the wet season on rich or on manured land, broadcast, and only covered, using about 90 pounds per morgen.

Bees and Bee-keeping.

A correspondent having written on the above subject asking particularly how to keep bees in a hive, his letter was referred to Mr. J. Martin, of Perseverance, who replied as follows:—I may say I had the same difficulty when I began bee-keeping some ten years ago. We used to think at home that bees would never leave brood, namely comb filled with eggs and larva, but I found the African parental instinct ignored even this. It is to be presumed that "use is second nature;" consequently, after centuries of building their nests in holes in the ground and in any receptacle that they could find, it can only be supposed that they just felt out of place in the hive as a raw kaffir would if located in a European's drawing-room. They will, evidently, have none of our new-fangled notions of up-to-date hives. The way to keep them in hives is to put a piece of excluder zinc before the entrance; this allows the worker bees to pass through, but the queen, being larger, cannot, except in an exceptional case, when she is very small. The bees may come out as I have seen them do, but when they find their queen left behind, will invariably return and settle down. If your correspondent cannot get this zinc excluder I shall be pleased to send him a piece and he can then cut it to the size of entrance to his hives. Getting the swarms to settle.—The old fashioned notion of beating a tin to get them to settle, was exploded years ago; the only way that I know of is to throw handfuls of fine earth, or get a syringe and syringe them with water.

Finding Queens.—This, after a little experience, is very easy in a frame hive. The best time is in the middle of a fine day, when many of the bees are in the veld. With your smoker, gently raise the quilt and puff a few puffs of smoke, not too much; then, when you have quieted them, gently raise the dummy board or draw it back, so that there will be room to raise the frames, without crushing or irritating the bees. With the forefinger and thumb of each hand on the shoulder of frame, raise it to your face; then, after a good look, if not there, lower your left hand, raise your right, and bring the opposite side of the frame towards you; do this until you find her.

The American hives, I think, are not large enough for this hot climate, but with our English hives, with frames running parallel to entrance, which hold, if necessary, twelve brood frames with dummy at back, it is quite easy. In my examination for Expert's certificate, (British Beekeepers' Association), this was one of the principal tests, viz., driving the bees without veil or gloves from a straw skep to an empty one and find her Majesty in five minutes, and, although some twenty years since, I have vivid recollections of the ordeal I had to go through in a bee tent with some two or three hundred people looking on.

There is no bee literature published in South Africa as far as I know, but I have Cheshire's two volumes, also Cowan's Book on Bees and the "G.B. Bee-keepers' Guide Book," published by the Editor of the *British Bee Journal*, which Journal I have taken in ever since I started bee-keeping. It is only 6s. a year, post paid here, and although Bee-keeping is somewhat different in this country, much useful information can be found in it which is applicable here. Then there is the American Root's Book on Bees as well.

Covering the Hives.—This would certainly not be the cause of their swarming, neither would the afternoon sun. The Bees do not require to be wrapped up like they are at home, but they certainly would swarm less if they had some shading, especially in summer. What we recommend to prevent swarming is a larger hive to give room, rather before it is wanted, and shade. This I think is a very important point. The swarms are of little monetary value here, and I make bold to assert if the swarming propensity could be bred out of them, our honey crop would increase with leaps and bounds.

Swiss Milch Goats in South Africa.

Mr. C. R. Gardner, in the correspondence this month, gives some interesting particulars with regard to Swiss milch goats in

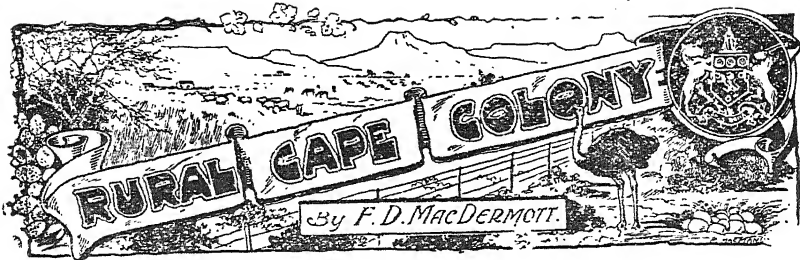
South Africa. As he specially mentioned the goats imported by Mr. Walter Rubidge, M.L.A., we drew that gentleman's attention to the letter, and he very kindly offered to supplement it with further information. Mr. Gardner, though correct in the main, is not quite accurate in his details. Mr. Rubidge states that he imported these goats three years ago—not two. That they are of the variety known as Saanen—(also called Appenzell); and that the original shipment consisted of seventeen animals—two rams and fifteen ewes. Of these he parted with nine to friends, keeping seven ewes and one ram for himself, and up to the present his flock comprises thirty animals, notwithstanding having sold about a dozen. Those who took the rest of the original shipment have not done so well, for among them all they have only about nine left. The original milking guarantee was not ten bottles per diem for all the ewes imported, with the exception of one. The ewes generally were guaranteed at five bottles per diem, and the exceptional one at ten, but the latter never gave more than eight. The change of climate, too, made practically no difference to them, for they are to-day, to all intents and purposes, the same as when they were landed.

The cost landed here, instead of £9 each as stated by Mr. Gardner, was actually £12 each, and Mr. Rubidge has sold the rams he bred at £10 each. They have been crossed on the Boer goat but so far Mr. Rubidge has no results to record, though he hopes to have some this season. Their prepotency is very marked, their progeny, in crossing, shewing their parentage at once. They are not beautiful, in fact Mr. Rubidge describes them as ugly, but he is deeply impressed with them as milkers and believes there is a great future for them in this country, particularly for people with small holdings. But to make a success of these goats they need handling with care and attention, otherwise they are such prolific milkers that they waste themselves to death. If left to themselves they will give milk up to the day they kid, and people who have but one are sorely tempted to allow them to do this. It should be unnecessary to point out the injury such action involves. As a result the ewe is so worn out, having no rest, that she becomes exhausted and dies in kidding. The loss is usually double, as well; for the off-spring is so weak that they also die. The ewes should be dried off for at least six weeks to two months prior to kidding. One of these goats (two-tooth) belonging to Mr. Hugo, of Aberdeen, gave birth to twins in September, 1904, and she has been in milk ever since, practically two years; but she aborted during that period. They will frequently, also, bear triplets.

Mr. Rubidge has had these goats in milk for two years, and states that 1,500 bottles per annum, is what the worst of them has given with him. He has sold the cross-breds at £3 each. Asked as to the ewe guaranteed to yield ten bottles daily he repeated that she gave an average of eight. But he had the greatest difficulty in getting her to dry off when he wanted to breed from her. This was managed by degrees, however, though it took three months to accomplish. She then gave birth to twins—a ram and ewe. The kids at birth weighed $26\frac{1}{2}$ lbs; the ram weighing 12lbs and the ewe $14\frac{1}{2}$ lbs. Three days before kidding, the udder of the dam was so enormous that she had to be lifted up when lying down. To shew how prolific they are, Mr. Rubidge mentioned that the ewe kid mentioned above was born in July 1905, and on the 25th, of June this year gave birth to twins. He further states that at first the udders do not shew anything very extraordinary and for the first three months they give about $2\frac{1}{2}$ bottles a day. The kids are weaned at about that age and from then onwards the milking improves until they get up to five bottles at which they continue steadily until they dry off. By judicious crossing and the continuous use of thorough-bred sires Mr. Rubidge believes it should be possible to establish flocks of goats in this country equal to those imported. They are both hardy and prolific, their only want being shade in hot weather. On hot days they always seek shelter, under trees for preference.

Cattle Swallowing Snakes.

Sometime back we published a statement giving details of a case in which a living snake was found in an ox. The *Live Stock Journal* recently published the following:—"One day in April, 1892, a cow on Mr. Muggs' farm at Lydlick, in Dorsetshire, was observed to be in great pain. She threw her head about so violently and inflicted such injuries upon herself that it was necessary to destroy her. A *post-mortem* examination revealed the presence in her throat of a snake and two newts. It was supposed that she swallowed them while drinking at a pool in which the water was low."



NO. XXI.

THE DISTRICT OF BEDFORD.

Compared to most of the fiscal divisions of this Colony, that of Bedford is a small one, its actual extent covering some 1,225 square miles, but in point of importance as a producer it ranks very high. Agriculturally its main crops are oats, usually marketed in the form of oathay, mealies, and lucerne, with wheat, barley, pumpkins and tobacco coming next. But the most important industry in the whole section is that of stock-raising, for which it is justly famous. The last statistics to hand (dated April, 1904) scarcely shew the full wealth of the district, as they represented the conditions which prevailed practically at the close of the war, but they give a fairly good idea of the distribution of the various kinds of stock farmed in this section. According to the official figures then published, the following was the position:—

Cattle.—447 Bulls; 7,935 Milch Cows; 7,040 Oxen; and 18,310 other cattle.

Horses.—127 Stud Stallions; 588 Brood Mares; 1,471 Horses and other Mares; 146 Mules and 210 Donkeys.

Sheep.—134,778 Woolled Sheep; 49,073 others.

Goats.—90,173 Angoras and 10,068 others.

Ostriches.—9,417.

Pigs.—1,499; and *Poultry* between 30,000 and 40,000.

From these figures it will be seen that the pastoral industry fills a large place in the farming operations of the district, and that the main branches of that industry which find favour are cattle, horses, woolled sheep and Angora goats. Ostriches are fairly prominent, and will in time take a more important position, this being mainly due to the success which has attended the efforts of Mr. O. E. G. Evans, who has established his flock of double-floss

birds there, and advanced so rapidly in his endeavours to improve that breed by selection and careful breeding. But of all the branches of industry that occupy the attention of farmers in this section, the indications seem to point more certainly in the direction of cattle and sheep as the ultimate predominant factor.

The topographical conditions are a fair indication of what can be done in country like this, and these are all in favour of stock-raising on a large scale. The district is divided into two sections, the upper or more northerly part being mountainous and broken, while the lower or southern section spreads in undulating grass lands away south from the town of Bedford toward the Fish River Rand and the high ground to the north of Albany. The upper part of the district is well-wooded, and shows a very fine natural growth of indigenous timber which, by the way, has not been conserved as it should have been, to the consequent loss of many of the cultivators. The natural forests which creep up the mountains above the town of Bedford in great luxuriance, have been cut out very severely, and in other parts as well the value of this timber has not been fully appreciated. One of the results of the denudation of the mountains is to be seen in the decreased flow of many of the streams which rise in their vicinity, and consequent curtailment of much of the agricultural activity. This was most severely felt during the recent drought, when thousands of head of stock had to be sent away for pasturage to more favoured localities. It seems a great pity that these forests should have been handled with so little thought for the part they play in the storage of moisture. In some places they have been used for timber, in others they have been ruthlessly destroyed to provide agricultural lands. In either case the value returned cannot be commensurate to the loss sustained by the district as a whole in the destruction of these natural reservoirs for the conservation of moisture.

There are honourable exceptions to the methods condemned above, and it is fortunate that there are a few who realise that in conserving natural timber they are holding on to an asset which is of untold value in a country like this, and one that is most difficult to replace. Prominent among these stands the veteran figure of Mr. Wienand, of Bellevue, within a few miles of the town of Bedford. To drive through the beautiful valley in which this farm lies, with its forest-crowned mountains rising in grandeur in the back-ground, is an experience not easily forgotten. And to turn the corner formed by the end of the range and contrast it with the appearance of the farm Maasstroom adjoining, where the timber has been sacrificed, brings home to one with redoubled force the sad pity of such short-sighted policy.

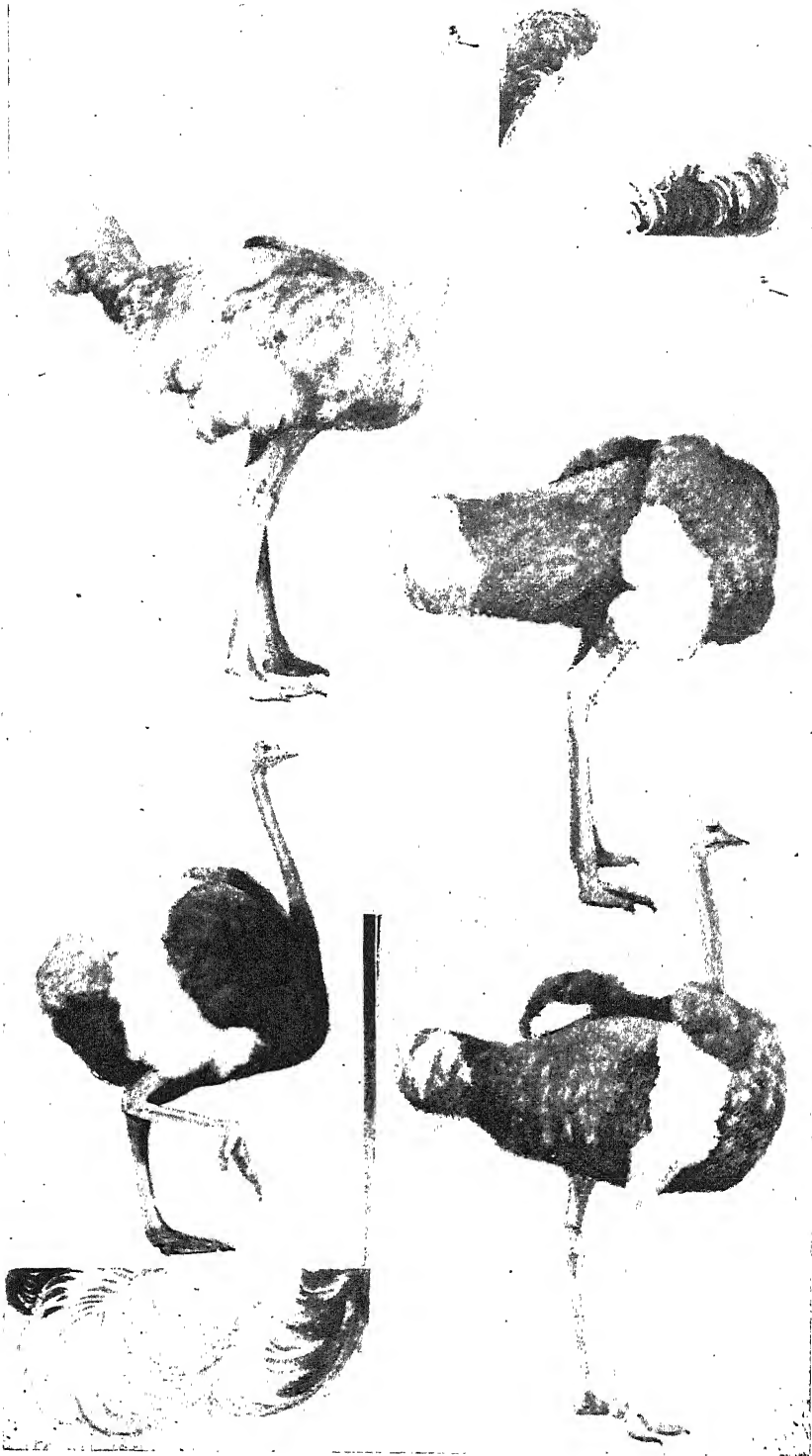
For stock of all kinds the district seems to be very healthy, and there are many thriving stock farms conducted on the most progressive lines. Of course there are others where the signs of decadence are not wanting, but these are not so prominent as in

some of our districts. The reason for a great deal of this is to be found very markedly shewn in the type of the farmers. It would be impossible for a district in which such sturdy yeomen as the Scottish Settlers of 1820 have been located for the better part of a century not to indicate the characteristics of such people. Most of the larger farms are well laid out, completely fenced and even sub-divided into paddocks for special purposes. Irrigation also



Typical Prime White Feather from Double Floss Ostriches, bred by
Mr. O. E. G. Evans, shewing density.

plays a prominent part on many of these properties and as a consequence lucerne is being produced on an ever increasing scale. Very large cereal crops, particularly mealies, are grown without irrigation, and in a few cases some of the older generation use irrigation waters for wheat and oats. But the latter style of cultivation is gradually being replaced by the utilisation of



Double Floss Ostriches, bred by Mr. O. E. G. Evans.
The hen at the top was sold for £100, and one of the cocks for £200 quite recently.

irrigation waters for the production of fodder. There are something like 2,500 morgen of land under irrigation throughout the district, and it is safe to say that the larger proportion of this is, or will be shortly, laid down to lucerne. The water is led out of the streams in most cases, but the possibilities of storage in large dams is being studied, and works to that end are being planned and carried out on several farms. Some have good-sized dams which catch and store the storm waters, while others are constructing them in order to prevent the enormous waste which is experienced in the wet seasons when the rivers carry off vast quantities of water which, with a reasonable scheme of conservation, might be held in reserve. The plan most favoured, and found to give the best results is to take advantage of some natural depression in close proximity to a stream and after constructing the necessary works, turn the flood waters into it. Several of the largest farmers assured me that had they not been provided with such storage during the recent drought it would have gone very hard with them, as, in some cases, even drinking water for the stock and domestic purposes was at a premium.

The soils of the district are, as a rule, fairly fertile, and most crops do well, particularly in the valley bottoms and on the old bush lands on the upper slopes in the highlands. But they vary very considerably. The lower lying portions of the district produce good sweet natural grasses, and in many of the valleys the thorn trees are so prolific as to become a serious menace to the pasturage. Some years ago a scale attacked these and killed off a large number but they seem to have recovered from that now, and are spreading at a great rate, and filling up very thickly. Many of the farmers are longing for some other parasite to happen along that will save them the trouble and expense of clearing the land themselves. At the upper ends of many of the valleys the soil thins off and the pasturage is sour, but sheep seem to do well even in these parts and there are some fine flocks, mostly of the Rambouillet-Merino type. Prickly pear has spread in many of the less accessible spots, but this evil is fairly appreciated and many of the farmers systematically eradicate it on their farms. In parts of the Baviaans River, however, it has gained such a hold, particularly among the broken and rocky krantzies, that hopes of entire eradication are almost abandoned.

"MELROSE," THE HOME OF THE DOUBLE-FLOSS OSTRICH.

As I entered the district from the Cookhouse side, branching off from that junction on the King-Cookhouse Railway, the first farm I called at was that of Mr. O. E. G. Evans, "Melrose." This property is situated at the junction of the Baviaans River with the Great Fish River, and is consequently favourably situated for irrigation purposes. The extent of this property is 3,500

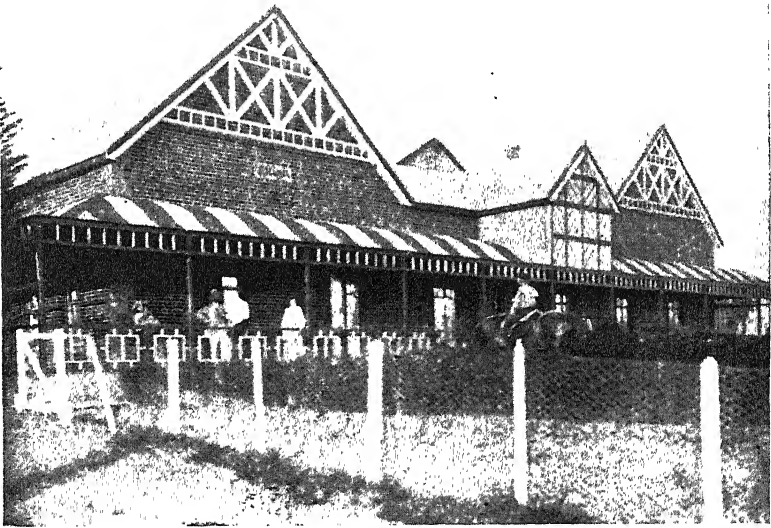
morgen, the greater proportion of which consists of undulating grazing land, and low-lying veld on to which it is not a difficult task to turn the waters of the Baviaans River. The latter stream is fairly dependable and gives a very regular supply, but it is hoped that, in time to come, much more will be made of it by extending the system of weirs and impounding a proportion at least of the flood waters which at present run to waste. But even as it is, it cannot be said that much has been passed over which might have been taken advantage of when it is considered that, previous to the present generation of cultivators, many of the farms in this neighbourhood could scarcely be made to support one family. At present this farm carries some 300 head of cattle, mostly of the cross-bred Friesland type, some 500 Persian-Afrikander Sheep, and about 350 Ostriches, including chicks. The latter, as is generally known, is the great feature of "Melrose," for Mr. Evans is notable throughout the length and breadth of South Africa now as the man who has established and proved the superiority of his special breed of Double-Floss Ostriches.

THE DOUBLE FLOSS OSTRICH,

well-known to all breeders who take an interest in this form of farming, is a type which Mr. Evans has devoted himself to bringing to perfection, and if the verdict of the market and every agricultural show of any importance at which he has exhibited his feathers lately, can be accepted, it has to be admitted that he has succeeded in placing his birds well at the top. At the last Grahamstown and Port Elizabeth Shows he practically swept the board, taking most of the principal prizes for different classes of feathers. The birds themselves are never exhibited, partly owing to the risk of rail travelling, and partly owing to a disinclination on the part of the owner to sending them off the farm where they are looked after with more care than many people give to their children. The history of this tribe is interesting, for it appears that originally they were an importation from North Africa. As is generally known, the ostrich is as familiar in the north as in the south of this continent, and when, some years ago, it was felt that an experiment should be made by introducing new blood among the domesticated birds in this Colony to improve the plumage, and a number of Eastern Province farmers decided to try it, they looked to the north for their new stock. The result was the importation of a few birds from the Barbary States. For some time they were kept near the coast, near Sandflats, I believe, and then passed into the hands of the present owner, who, by careful selection and matting, has produced the birds with the beautiful plumage and good constitution which are now so much in demand.

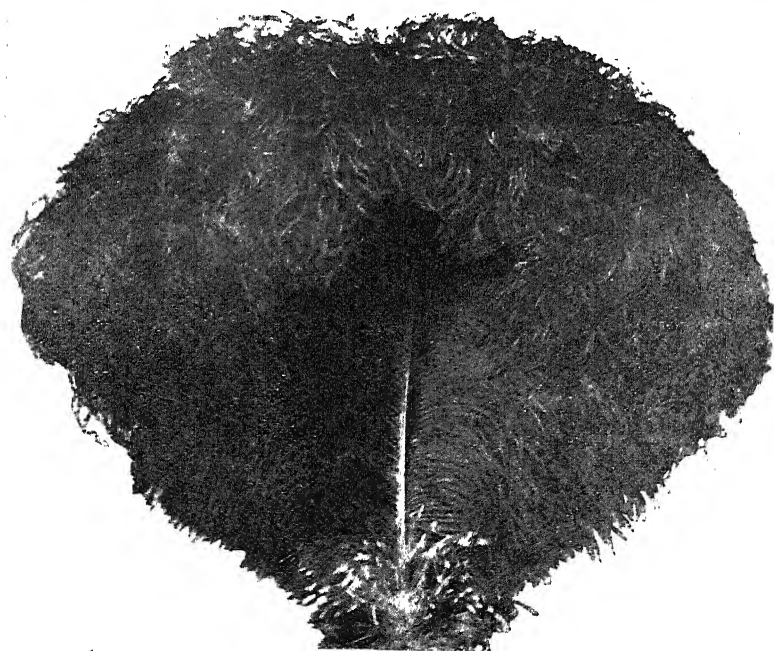
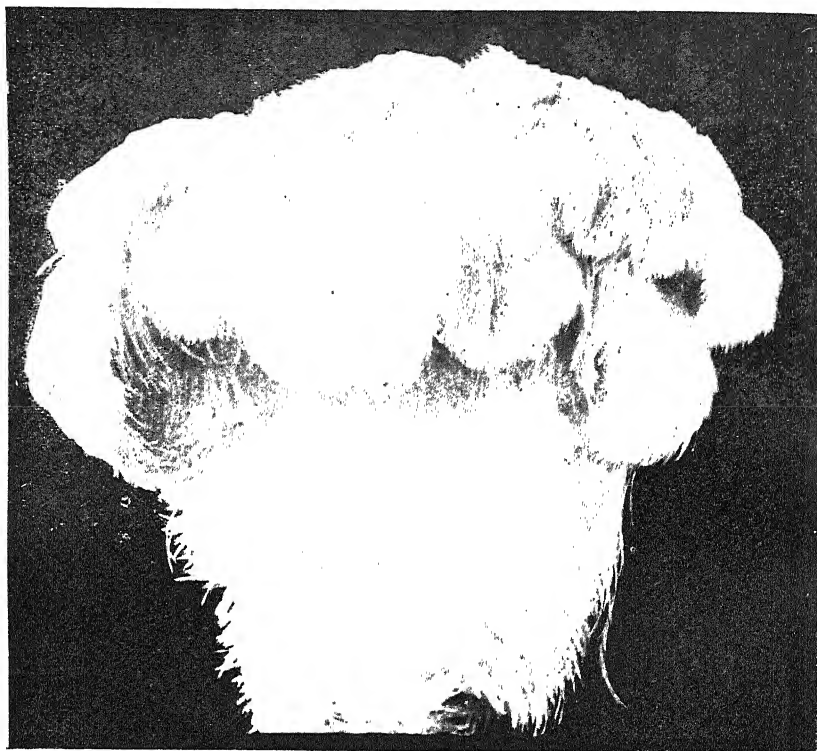
Whilst visiting "Melrose" I was fortunate enough to secure some fairly good photographs of some of the most typical of these

birds and they are reproduced herewith. From these it will be seen that the most striking feature of these birds is the density of the plumage, and the grand condition in which they are all maintained. The photographs of the feathers, those reproduced being the prize-winners, shew the density even more prominently than those of the birds. The origin of the term "Double Floss," by the way, may as well be explained here. It was given to this type of bird as describing the feathers. The plumage is so dense that when examined closely the barbs seem to be doubled, whereas when they come to be examined under a glass it is found that this appearance is given by the closeness with which the barbs lie to each other. It has to be admitted that the feathers of these birds



"Melrose," the home of the Double Floss Ostrich.

do not, as a rule, grow so long as those of the best type of Oudthoorn feather, and are not so heavy, therefore, from the breeder's point of view, though the one may be favoured by the buyer in the point of price. the grower of the other can usually depend upon making up by weight per bird very nearly as much in value as the finer quality feather brings. There is a very great difference of opinion among the breeders upon these points, so it would not do for me to intervene here; but it must strike anyone who studies the subject from the commercial standpoint that the future of the ostrich feather industry must lie in quality and not in either weight or quantity. It is unnecessary to add that Mr. Evans is careful to keep his high average prices for breeding birds. Just



Prize Winning White Feathers and Blacks from Ostriches bred by Mr. Evans.

before I visited the farm one of the young cocks in the illustration herewith had been sold for £200 and the hen for £100. These prices are encouraging to the breeder of high-class stock and shew that provided our farmers are satisfied that they are getting the right article, they do not hesitate to pay a good price for sound stock.

IRRIGATION.

The irrigation side of this property is one of the most interesting in the district. When Mr. Evans took this property in hand some 15 years ago, at first in partnership with his brother, and afterwards by himself, the great problem was the water supply, and as the seasons seemed to become less and less favourable this problem grew in proportion. The solution of the problem was undertaken in the most systematic manner. Not only was the river drawn upon, but boreholes have been sunk in places, and by the aid of windmills the farm has now a copious supply for all purposes. The water is taken out of the river by gravitation and used on the low-lying lands, by which means upwards of a hundred acres of lucerne are kept in a flourishing condition and there is consequently always an ample supply of fodder on hand in addition to that consumed by the ostriches in the camps which are all laid down to lucerne. The boreholes and windmills act as valuable auxiliaries to the gravitation furrows of which there are some 4,000 yards on the main system, 7 ft. wide and 3 ft. deep, without counting the distributing furrows. There are three boreholes. One is placed on a spring in the Baviaans River, and the windmill pump, after lifting the water a hundred feet or so, delivers it at the house, a distance of some 1,500 yards away. The supply from this is about 1,150 gals. per hour, which is delivered into a large reservoir specially constructed to give water for domestic purposes and irrigation for the garden. The other two boreholes are quite close to the homestead. On one is a small mill, but on the other, a six-inch hole, Mr. Evans has erected a power mill with an 18 ft. wheel, which lifts 3,000 gals. per hour from a depth of 127 feet. This machine is also fitted with pulleys and belts which can be used to drive a saw or any other light machinery which may be needed for use on the farm. The mills are all of the type known as the "Dandy," and were fitted up by Messrs. Mangold of Port Elizabeth.

Of the many problems which have been tackled and solved on this property, several were in connection with irrigation, and they have resulted in one or two rather ingenious devices. Most irrigators know the troubles of water distribution, and how difficult it is to keep furrows in order when the banks have to be broken for flooding purposes. Some are so situated that they can manage to do all they need with fixed sluices, but these are the fortunate ones. All lands are not so level and so carefully graded as to admit of this method of working, and as it was found in some of the

paddocks that difficulties had to be contended with, an ingenious movable sluice was constructed, which has done excellent service ever since. The particular problem in this case was to prevent the banks of the sluits from washing away, and at the same time put the irrigator in the position of being able to open them at any place and flood from the furrows. To do this a portable sluice was constructed, consisting of a piece of boiler plate, about four feet long and eighteen inches deep, with the ends turned over so as to prevent erosion of the banks. In the middle of this is cut an aperture of the size required, and to this is fitted a canvas shute, formed almost like a funnel. This shute is fastened to the sluice by means of movable bars and nuts on the inside. When needed for use the sluice is placed in position with the canvas shute turned over so as to prevent the water getting through. The bank is then cut away, and when the opening is large enough the shute is thrown into it, the water flows through, and the field is watered without the banks suffering any appreciable damage. It also serves to regulate the supply. When the watering is finished the canvas is turned over again, the flow stops, the bank is filled in, and the whole contrivance moved on to another place. With two or three of these simple appliances a large amount of irrigation can be done which would call for constant attention with the spade by the ordinary methods.

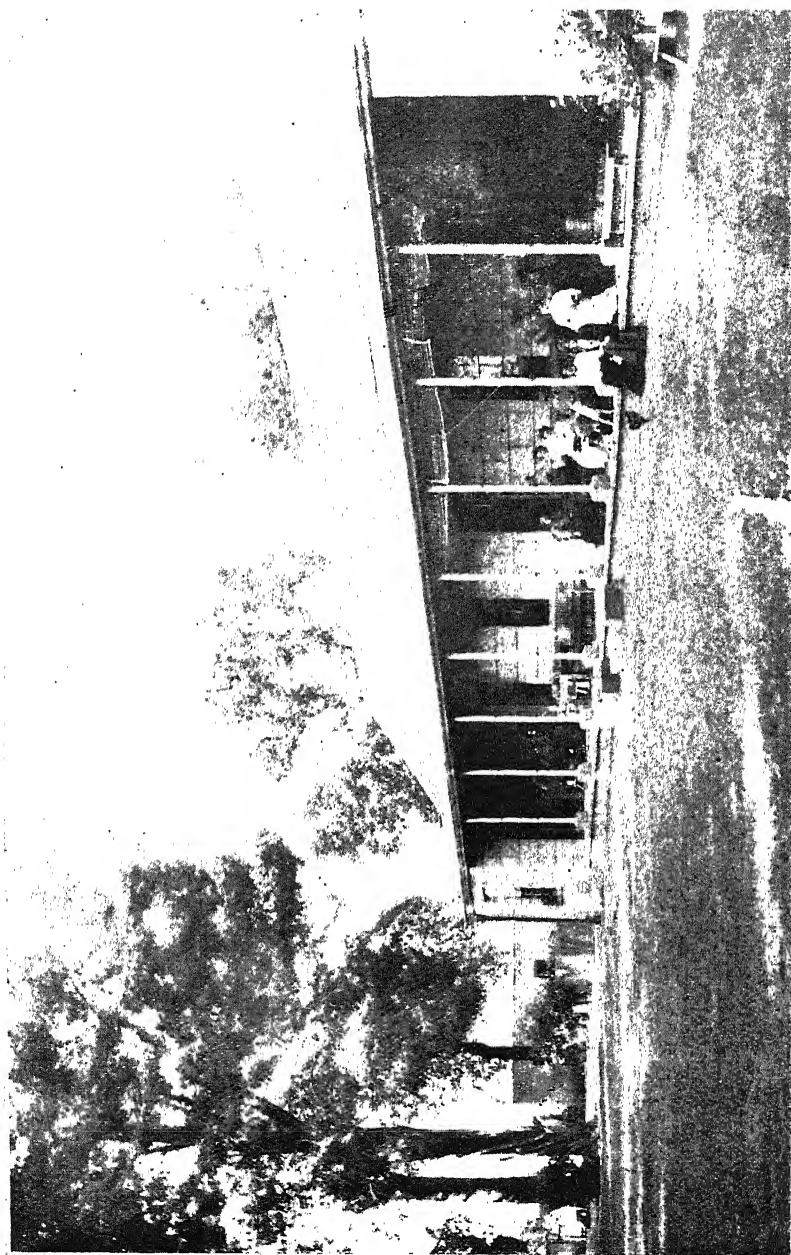
One of the striking features of "Melrose" is the beauty of its surroundings, with the mountains in the background, and the wide spread of country in front, dotted with the peaks of the higher ground that flanks the Fish River Valley. The new homestead, a view of which is given herewith, is both substantial and roomy, and from its position commands a view of the whole of the farm, including the breeding camps where the ostriches are kept. To stand on the wide stoep and watch the whole of the farm work going on is a treat not often vouchsafed to the wanderer in the back blocks. The whole of the buildings are of the same substantial type, and include several large barns for the storing of lucerne, workshops, &c.

Not much has been done in fruit, with the exception of a hundred or so fruit trees and some vines planted in the garden, and walnuts. Of the latter, Mr. Evans has planted over 300 along the water furrows in the lands, and they are thriving so well that he has every justification for the pride he takes in them. They are of an early French variety, and in the course of time should give an excellent return on the outlay.

Another striking feature which it is impossible to omit is the excellent fencing which is to be seen on every hand. Wire everywhere, around the farm and through the farm; for it is all divided into paddocks, and each paddock is supplied with the Evans patent gate, a contrivance of hanging chains which had a great vogue at one time, but is now superseded. The advantage of this is that the veld can be rested and restored with ease. The



Pair of Double Floss Feathers showing the natural curl, and Bunch of Prize
Winning Fancies from birds bred by Mr. O. E. G. Evans.



The Homestead at Lynedoch.

system of grazing and resting is constantly practised with most gratifying results. The prickly pear, too, is notable by its absence, for except in certain spots where a little is kept for feeding purposes, every plant has been eradicated, though at one time the whole of the veld was covered with it. The neighbouring farms can boast some fine crops of this succulent, though aggressive, plant, to this day.

IN THE PRINGLE COUNTRY.

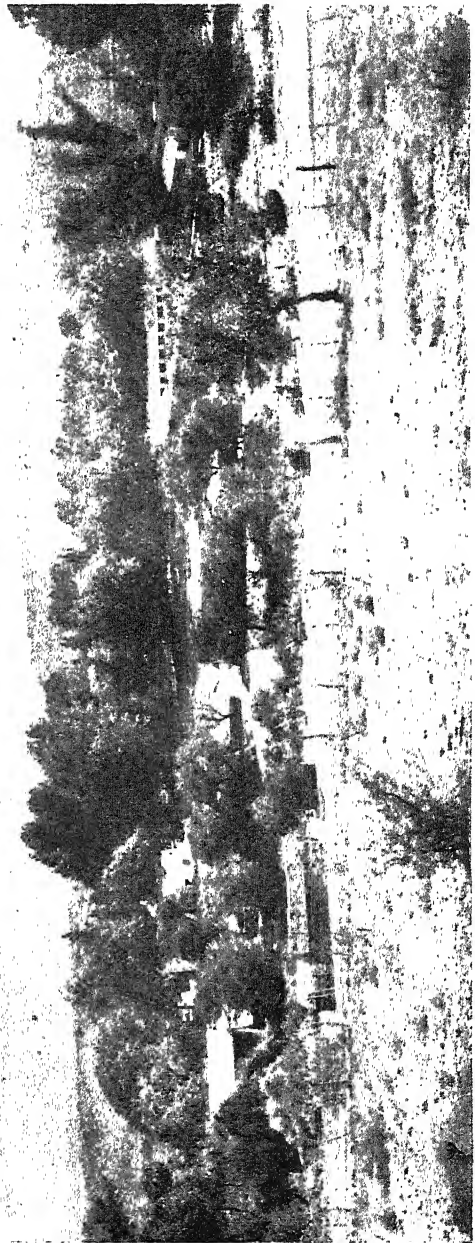
After leaving the neighbourhood of "Melrose" I moved up the Baviaans River Valley, closing into a most picturesque gorge, grand in its effects, but for some distance far from inviting from the agricultural point of view. A good deal of it has rather gone to seed and is over-run with prickly pear and scrubby bush. But as the demand for land grows, most of this will be reclaimed and brought into service. As it is, cattle seem to thrive very well and once the struggling dairying industry gets well established, will no doubt do its share in helping to solve the food problem of the country. Some eight miles along the valley one comes to a more promising set of conditions. Just above the point where the fertile valley of the Lichtenstein debouches into the main gorge, the country opens out a little and after passing the small hamlet of Glen Lyndon the traveller begins to enter what I may term the Pringle country. At "Lynedoch," one of the older homesteads of the district, I was met by Mr. Robt. Pringle, a pioneer and of pioneer stock that goes back to the early part of last century. "Lynedoch" is beautifully situated right on the banks of the Baviaans River, and is not far from where the original Pringle party of emigrants were settled in 1820. It was here that the poet, Thomas Pringle, must have inhaled a good deal of his inspiration, for it is a grand though a rugged country. The actual spot where the Pringles originally settled was at Eldon, a few miles higher up the Baviaans River, and from here they spread out over the district, and, for that matter over the Colony too, for members of this family have gone out into most parts of South Africa. At the present time Lynedoch presents a most charming appearance with its beautiful setting of pines, eucalypts and oaks standing out against the background of the surrounding mountains, but the time was when there was scarce a tree on the property. This is seen very vividly in an oil painting by the late Mr. Baynes, shewing the place in 1847, which hangs in the dining room at Lynedoch. By permission of Mr. Pringle I took a photograph of it and it is given in the general view of the homestead. The growth of trees in so comparatively short a time is little short of wonderful. Some of the more mature are nearly eighty feet high and still thriving. The pines which have done best are the Aleppo or Jerusalem pine (*Pinus halepensis*); the Cluster Pine (*Pinus pinaster*) having failed after attaining a fair growth. The homestead itself stands in a huge

quadrangle thickly planted with these fine trees, and surrounded on all sides by a substantial stone wall. On the side facing the homestead is another dwelling in the form of a stone-built cottage with a roomy interior and a large garden. These, together with a water-mill and rows upon rows of well built stone stables, byres and barns give an air of substantial comfort and prosperity to the place that stamps it as the home of energetic and intelligent farmers. This is the only original farm on the river not divided, and it is well fenced with jackal-proof fencing. If anyone is desirous of being convinced in favour of jackal-proof fencing he should visit some of these farms and see what it has done for them. In discussing the subject with Mr. Pringle he remarked that this form of fencing more than paid its cost by being used as hospital camps. It is difficult to imagine a higher testimonial.

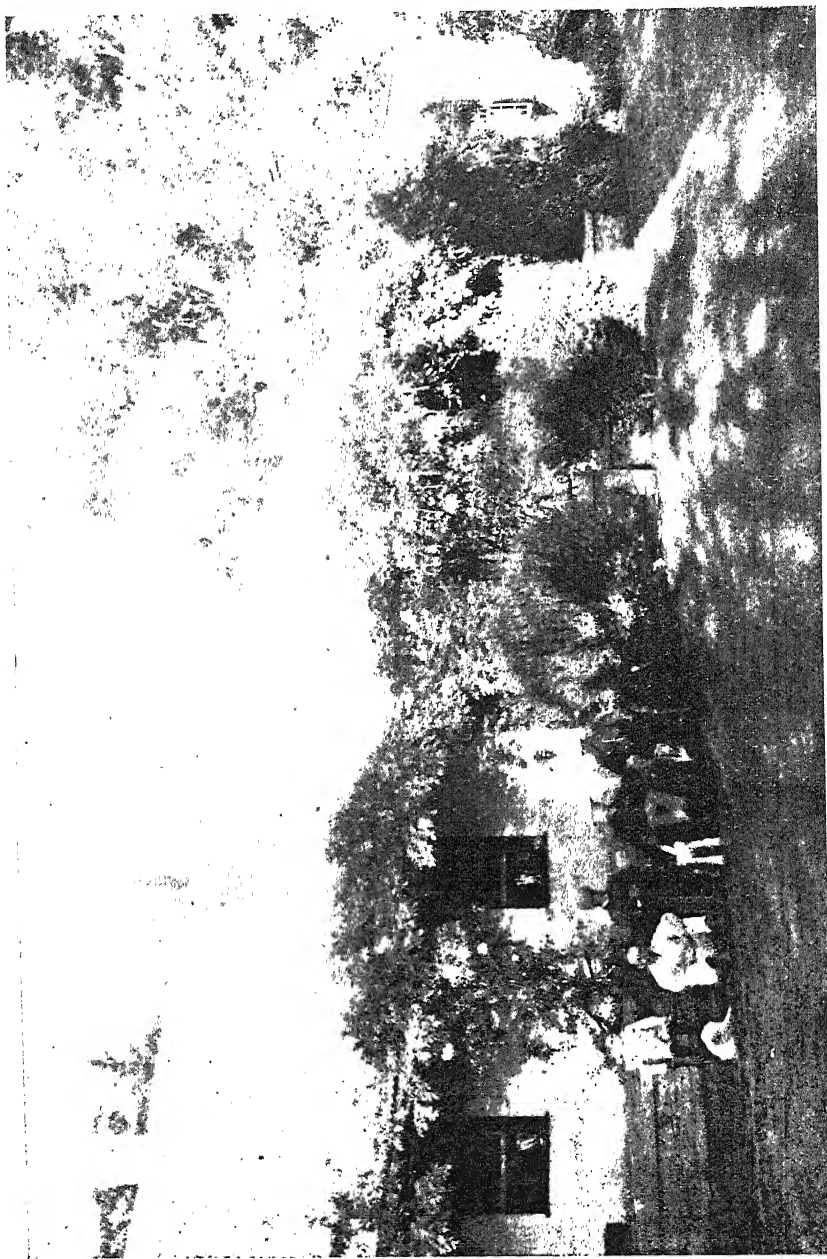
The farm "Lynedoch" is 6,700 morgen in extent having been originally the property of the rebel Bezuidenhout who was in the Slagter's Nek affair. It was then confiscated and granted to Col. Graham, who sold it to a third party, the present occupier's father bought it from him, and the Pringles have made it what it is. It is now mainly a stock farm, Angoras and cattle being the main crop. Cereals are produced on a large scale, wheat being grown to advantage. Oats are also a good crop. Lucerne has not as yet been sown to any extent, though one patch on the farm is over 40 years old, but it is among the good things coming that should make a tremendous difference to the property. Irrigation waters are available from the river, and the mill is driven from the same power. In addition to this, Mr. Pringle has constructed a capacious dam higher up the valley which holds a very large quantity of flood water so that there is plenty of room for the younger generation to develop if they are so inclined. Ostriches thrive well and they are gradually being introduced so that with cattle the farm is kept well stocked. It was an interesting experience to stroll through the fine old garden and orchard at the back of the homestead and listen to Mr. Pringle's anecdotes of the earlier days and the troubles the old folk had to overcome. And then to look around and see beautiful citrus trees thriving along with walnuts and other fruits and the magnificent growth of timber trees as well, one could hardly believe that so much had been accomplished in so comparatively short a time. In the garden among other plants a Bay tree is thriving.

THE LICHTENSTEIN AND "BELLEVUE."

Not having too much time to spare I was compelled to postpone any intentions I might have fostered of trying to get higher up the Baviaans River, so, bidding farewell to Mr. Pringle, I moved back for a part of the way, and turning into the Lichtenstein Valley headed for the well-known property "Bellevue"



Lynedoch from the Hill, present day, with sketch of painting by the late Mr. Baynes, showing Lynedoch as it was in 1847. The photo was taken, as near as could be judged, from about the same position as that occupied by the artist when he painted the picture.



The Homestead at "Bellevue."

where Mr. Wienand has lived for so many years. The Lichtenstein is an interesting valley. It is practically speaking irrigated almost from end to end. The stream is not a large one but seems sufficient to keep a good deal of ground under cultivation in small allotments. It is pretty closely populated and reminds one in this respect of some of the valley streams in the Oudtshoorn district. Here, if anywhere, one would expect to see permanent crops, but cereals seem still to be largely the fashion, though judging by the looks of the country it should not be difficult to lay down large extents of these lands to lucerne. In point of fact on one property near the mouth of the valley "Avondale," belonging to Mr. C. Webber the crop is thriving apace. With stock and agriculture, however, the people seem to be doing fairly well. There should be an opening in some of these sheltered valleys for fruit culture if the farmer could be induced to take it up and introduce it gradually. The soil looks good and is undoubtedly deep, while there is quite sufficient water for all that would be required in well-cultivated ground. On many of the farms citrus fruits do exceeding well hereabouts, and there can be little doubt that apples and pears would also prove profitable. Nearly all the citrus trees are seedlings and a good many of them have been planted with but little knowledge of the requirements of the plant, yet they thrive and give good returns. With so short a distance to travel to the railway it would pay to go in for fruit, especially in such a favoured spot as the Lichtenstein valley with its small holdings and irrigation waters.

A steep climb of several miles brought me to the top of Wienand's Nek and a steeper decline on the other side landed me at "Bellevue" where I was met by Mr. Wienand senior, who is still hale and hearty in spite of advancing years. The Wienand family occupy a large stretch of country about here and make good use of it for as far as possible they are all doing their best to enhance the natural advantages. "Bellevue" itself covers upwards of 5,000 morgen of land, a good deal of which is mountain veld. Then one of the sons, Mr. Louis Wienand, has a large farm on the Baviaans River where he runs upwards of 4,000 Angoras of a good type. Near Eastpoort station—alongside "Melrose,"—another son Mr. E. N. Wienand is married and settled on the farm "Arelson" where he is rapidly carrying out many permanent improvements, and Mr. Fred, Wienand is working "Bellevue" with his father. I called in at "Arelson" while I was at "Melrose" and saw a good deal of the projected improvements there. These included a large earthen dam thrown across a huge vlei which extends right into the adjoining property, the object of which is to collect storm waters to be used for irrigating lucerne lands later on. These are now being laid out, the stumping and clearing going on while I was there. This is also a stock farm, cattle, ostriches and Persian sheep being the principal crops. The water supply at present

comes from two boreholes worked by windmills. Mr. Evans is also intending to dam this vlei on his property so that between the two they should be able to hold up a goodly quantity of flood water which, later on, can be thrown on to what is now bare veld, and bring about vast improvements. Everybody here seems fully alive to the value of water conservation and it is only the lack of capital I was assured which prevents more works of this description being taken in hand.

"Bellevue" itself is not only beautifully situated, but is also a very fine farm, more particularly for stock-raising. On the uplands the grazing is excellent and thanks to the preservation of the natural forests on the mountains, there is a plentiful supply of water for all necessary purposes. On the lower lying lands there is plenty of room for cultivation and a good soil which gives excellent returns. One fine paddock of lucerne is in full swing and others are in course of preparation, these being irrigated from the mountain streams that are fed in the forest. Ostriches of the double-floss type are being introduced and in course of time they will no doubt be a strong feature on the property.

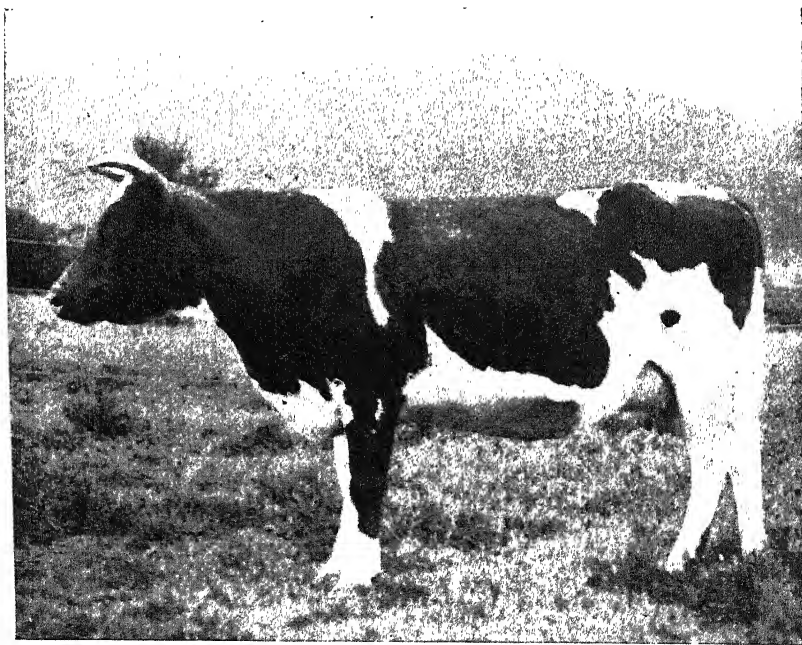
The show side of "Bellevue," however, is the cattle. One of the finest and best known herds in the Eastern Province is located here. They are all pure-bred Frieslands from original stock imported many years ago by Mr. Wienand, senior. And they have been maintained at a very high standard ever since. Being close to Bedford it has been possible to conduct a paying dairying business for many years past and, now that the Creamery is established and a going concern once more, these advantages have increased. With this I give some reproductions of photographs I took of this fine herd. It has to be remembered that they are shewn just as they were driven in from the veld; there was no attempt at "getting them up." The photographs will speak for themselves. In addition to the cattle, Angoras and woolled sheeep are also farmed here, the latter being mostly of the Rambouillet strain. These are all pure and have been kept so for many years past. The general work of the farm is conducted with the same scrupulous care as is shewn in the breeding of the stock. While others have been content to allow a pest like prickly pear to get the better of them and the torrential rains to erode their farms into deep sluits and ravines, the Wienands have always tried their best to keep such things at arm's length. Prickly pear has been systematically tackled for years past and very little is to be seen about. Sluits are also taken in time and prevented by simple measures from becoming a menace. These consist largely of stopping cattle tracks with branches or throwing a little soil into them to divert the flow of water. It is wonderful how these precautions, simple though they appear, effectually prevent the formation of sluits. The homestead itself is hidden by foliage while a fine garden fills up the fore-ground. Among the more interest-



The "Bellevue" Herd of Frieslands shewing Milking Cows
and young Heifers.



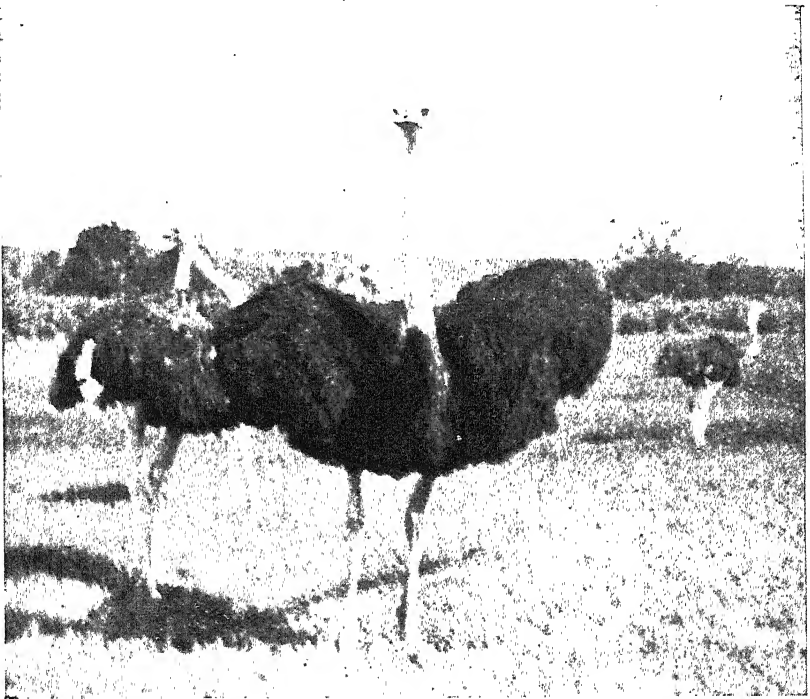
"Pronk," a two-year old "Bellevue Friesland Bull.



"Snarks," a young "Bellevue" Friesland Cow.

ing features for the sightseer are a couple of tame Koodoo which roam in a small paddock by the homestead, and afford infinite interest to every caller. The stables, kraals, cattle sheds and out-houses are all substantially built of stone, while close to the lucerne paddocks a large barn has been constructed to store fodder.

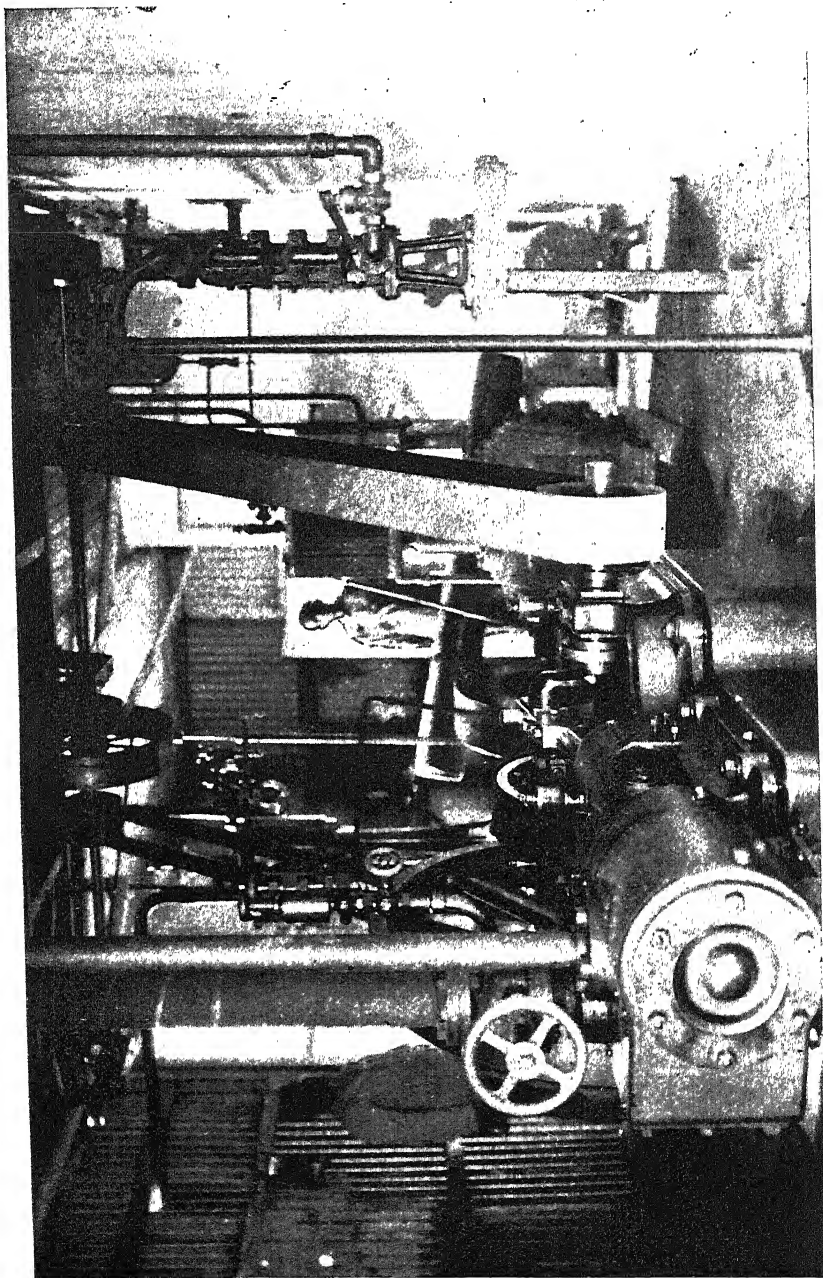
In fencing this farm is something of a model. It is divided into nineteen camps, each carefully fenced with wire, and in each camp there is a dam for drinking purposes so that the stock has every chance to thrive without being worried with long treks for water or shelter. The milking is carried on at out-stations



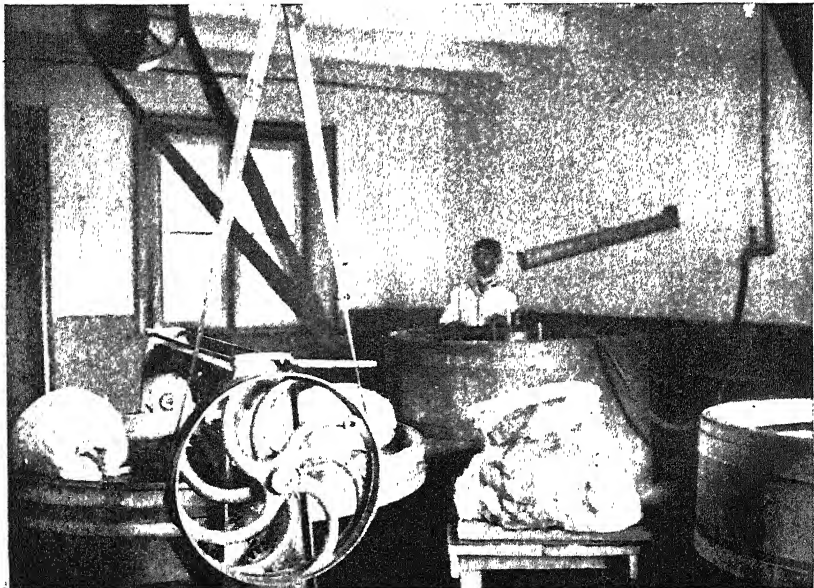
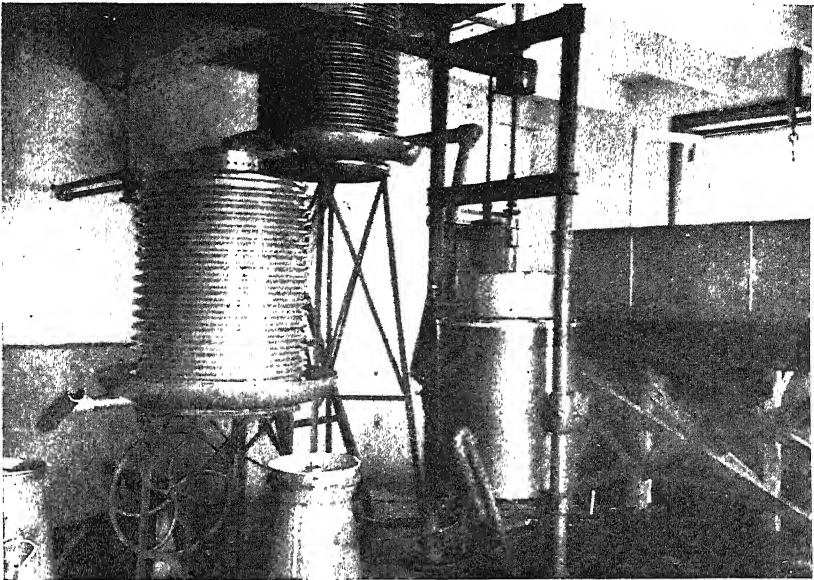
Young Double Floss Ostriches at "Bellevue."

where the cattle muster morning and evening and the milk is gathered up in carts and despatched to the creamery straight away. System is the order of every day here and it works with wonderful precision.

Fruit on the commercial scale has not yet been attempted, but Mr. Fred Wienand is thinking of making a start. He has selected a sheltered spot on the hillside where water is available and proposes to establish a citrus orchard there so soon as the ground has been prepared. The position seems favourable, and the soil is evidently fairly deep so the venture should prove a success.



The Engine Room of the Bedford Creamery.



Pasteurising Plant and Churn Room, Bedford Creamery, shewing Butter Workers and Butter in foreground.

BEDFORD AND THE CENTRAL CREAMERY.

After leaving "Bellevue," as I was so close to Bedford, I looked in to see what the Bedford Creamery was doing for the farmers of the district. On the way we passed out of the mountainous parts and came into full view of the rolling grass downs that form the lower part of the district, but as there was so much for me to see in the course mapped out I could do no more than look at this part of the district reserving a mental note to make an effort later on to visit it.

Arrived at Bedford through the farm of "Maasstroon," I lost no time in waiting on the newly-appointed manager, and though he was exceedingly busy he took the trouble to shew me over all the buildings and explained the working in detail. I managed also to take the accompanying photographs which will give some idea of the extent of this institution. Mr. Moore, the manager has but recently arrived from Ireland, where he was engaged under the Irish Agricultural Organisation Society as a Creamery Expert, and was brought out to this country by Mr. P. J. Hannon, Superintendent of Agricultural Organisation, to take charge of the Bedford and Cottesbrook Creamery which, through misfortune, drought, and other things, had fallen upon evil days. He had only been there a couple of months when I arrived, and most of those interested expressed the highest satisfaction at the manner in which he was pulling the whole business together. so there is some hope for at least one of the largest Creameries in the country being put upon a satisfactory footing. Not content with merely attending to the duties devolving upon a Creamery Manager, Mr. Moore is doing even better work by going among the farmers and giving them hints and instruction in the most up-to-date methods of handling cows and calves for profit. He has even gone so far as to shew the native milkers how they should milk the cows, and caused some consternation and amusement among some of them by his dexterity. It is stated that the natives are all fully convinced that he is not an ordinary man at all, but "has a machine up his sleeve." If we can manage to introduce a few more energetic and enthusiastic expert young men like this, the dairying business should soon assume larger proportions than it does at present.

The Bedford and Cottesbrook Model Dairy Co., Ltd., is one of the biggest concerns of the kind in the Colony, for in addition to the Dairy at Bedford, it has another at Cottesbrook and has a large place at Port Elizabeth where pasteurised milk is distributed to the townspeople just as it is sent down from Bedford. It was originally started by Mr. Llewellyn Roberts of Cottesbrook some ten years ago. It succeeded so well in the hands of Mr. Roberts that it was floated as a limited liability company with a capital of £20,000, but since then has fallen upon drought and bad times generally, and the consequence was that when the Government



Co-operative Scheme was started representations were made for assistance. At the end of the negotiations the capital was written down and a loan effected, which, it is hoped, will set matters straight. That seems to be roughly the financial history of the concern. The business position to-day is that it is equipped with a full plant for butter making and pasteurising milk on a large scale and a very large business has been done during the past season. The buildings are substantially built and situated in the centre almost of the town of Bedford. The power used is steam, generated by a Ruston & Proctor boiler, and the engines are up to 20 h.p. The refrigerating is effected by means of an Enock Ammonia Freezing Machine of six tons capacity, and when I was at the Creamery they had some 18 to 20 tons of butter in cold storage. The full capacity of the churns is 800 lbs., and the pasteurising plant is equal to 600 to 800 gals. per hour. The water is obtained from a borehole on the property, 180 ft. deep, which is worked by a windmill pump. The milk trade at Port Elizabeth seems to be one of the best assets of the company, for something like 300 gals. are sent there daily, all carefully pasteurised, and there is a continuously increasing demand. With such prospects before it, this Creamery ought to be in a position soon to shew what can be done by such an institution. All that is necessary is that the farmers of the district should lay themselves out to assure an ample supply of milk. To make such an institution an assured success the cattle-farmers should now obtain the best strains of milking stock and provide plenty of winter-feeding in order to maintain the supply. If this can be done, and the calves raised with care, there should be a splendid future before this company, more particularly now that they have a manager who not only commands the confidence of all, but who has shewn, in the short time he has been there, that he can materially assist the farmers in carrying their own business to a successful issue.

Next month I shall deal with the Cowie Valley, the Mancazana and a portion of the farms along the Kaga on the lower side of the district.

THE VALUE OF PEDIGREE.

BY A SOUTH AFRICAN FARMER.

What is pedigree? Simply a line of ancestors. There is no living thing now in existence that has not a pedigree; but it is only a small fraction of these that are recorded. And why? Because man only records those that will be of use, or interest, to him, and these include only such as are more or less influenced by his power of mating the sexes. And again it is only a small percentage of these that are recorded, and this because, unless there are one or more individuals of more than ordinary merit figuring in the pedigree, it would not be worth recording. Hence a recorded pedigree is a sure sign that the animal has had one or more ancestors of exceptional merit. We are now dealing with the animals of the farm, though the principle holds good with all living things. "Exceptional Merit," as applied to different animals used for different purposes, means merit in the particular direction sought after. Therefore we may assume that animals owning a recorded pedigree, have ancestors that were prominent in their day for possessing the characteristics for which such animals are to-day valued. As generally understood, the word "pedigree" means a recorded pedigree only.

The foundation of the breeder's art,—for art it is, and that of the highest, this moulding of living creatures to our needs, and one that carries great responsibilities to those who think,—this foundation, is the rule, that "like produces like." Therefore we see that a good pedigree, that is one which shews a long succession of ancestors each noted for a certain similar characteristic, shews a concentration of this characteristic in the animal owning such a pedigree; and is a guarantee that this animal will in turn transmit this characteristic to its descendants, even though mated with animals not possessing such. Hence the increased value of such an animal over one that cannot shew a similar pedigree though perhaps of greater excellence itself, the result it may be of a "sport" or reversion. Unfortunately this rule that "like produces like" is, like all rules, subject to exceptions, these exceptions being subject to other rules, causing the uncertainty, and consequent fascination which attaches to the breeder's calling, otherwise it were a simple matter to breed good animals. But on these exceptions this article will not touch, suffice it to say that they exist.

Still more unfortunate, is the fact, that an animal may fall into the hands of an incompetent or indifferent owner, and though the recorded pedigree may still continue, yet, owing to mismanagement the animals may in time become very far removed from the excellence of their original ancestors. Yet so strong is the influence

of concentrated blood, that even these may, when mated with others of less concentrated blood, produce a certain number which revert to the original excellence. This being one of the laws of nature, that an outcross or infusion of alien blood generally causes reversion to a former type. It will be seen therefore that the value of a pedigree rises or falls accordingly as the ancestors recorded conform to the type sought after.

It behoves every careful breeder in purchasing an animal for breeding for stud purposes, to see not only that the animal is excellent in itself, but that its pedigree contains only animals of excellence; or if it be impossible to determine this latter point, to see that these recorded ancestors were approved of by breeders of pre-eminence whose judgment he is content to trust. It must be remembered, however, that only a small number of pedigreed sires are mated with pedigreed dams, the greater number being used for the purpose of grading up the inferior animals of the same variety. It is not desirable nor possible that all our farmers should be stud breeders. The breeding of high class animals demands capital, time, and unwearying attention, and most important, a genuine love for them that overcomes all the difficulties and disappointments which are sure to arise. It is the stud breeder's calling to produce sires for the farmer which will result in his farming becoming more remunerative, and according as this is so, so will the stud breeder benefit or otherwise. In our country—which is destined yet to produce some of the finest stock of the world—there is at present a great want of appreciation of the value of pedigreed sires for crossing purposes; doubtless this arises in a measure from the names of animals and breeders, in the pedigrees of imported animals, being somewhat of a myth to the average colonial farmer, who has but slight means of judging of the value of such a pedigree. It is to be hoped that the South African Stud Book, which is in process of formation, will in time alter this and will inspire more confidence in the value of a pedigree; but to avoid the bringing of pedigrees into disrepute, great care will have to be exercised to grant none but those above suspicion. Unless a stud or herd book certificate is a guarantee of purity of descent it is worthless. Because, after all, a pedigree is only a guarantee that an animal's ancestors have all been of one type and breed, it is no guarantee that they have all been super-excellent or that the animal itself is super-excellent; the latter point the purchaser must determine for himself, the pedigree certificate merely tells him the animal's progenitors, as far as the record extends have conformed to a certain similar type, which is called being pure-bred; if it cannot surely guarantee this, it is useless.

At times a farmer may be heard to say that a certain animal is pure-bred, whereas on cross-examination it is found that neither it nor its parents have any pedigree, the assertion merely resting on the fact that it is descended from a remote ancestor or two

which had pedigrees. Often such a statement is made from absolute ignorance and can be forgiven, but more often from a laxness of conception of what a pure-bred really is, or it may be even a wilful blindness. This is not to say that an owner of an animal may not be able to produce evidence that it has only pure-bred ancestors, though a detailed pedigree may be lacking; in flocks a collective pedigree is often accepted. Now it takes more than one lifetime to make any breed of animals really pure, the length of time depending on the age at which the animals re-produce themselves. But often an animal can be produced that has the character of the pure-bred, and which will transmit this character in some degree to a portion of its progeny, by simply taking an ordinary specimen of the variety, and drowning the alien blood by using pure-bred sires on successive generations for a considerable time. In other words "grading up." Such a pedigree—termed a "short pedigree"—bears a less value than a long or full blooded one for further grading up purposes, though it may be possibly of more value for invigorating the blood of pure-breeds that are suffering from "over" or "in" breeding. It is almost a certainty, that a sire which has even one outcross of alien blood in his pedigree, even though many generations back, will shew it distinctly in his progeny when mated with inferior or alien dams, though with pure-bred females of the same variety it would not be apparent. In our country owing in the past to pedigree sires being few and far between, farmers wishing to grade up their common stock, have been forced to use sires varying in degree from half to fifteen-sixteenths bred; and to this may be attributed the slow progress made, evidenced by the wonderful variation in character of the individuals composing the breeding stock of the farmers, not excepting those who pride themselves on always having used good sires of one breed. In addition many have been in the habit of changing from one breed to another and yet another, the temptation being the fact that a first cross generally produces a taking and profitable animal, but ending as it always does in chaos, leaving the farmer where he started, with all sorts and conditions of animals. Had he used none but pedigree sires of one breed he would have had a breeding stock uniform in character, and, if he was careful to select only such sires as seemed most fitted to his needs, uniform in profitable qualities. The value of pedigree in the grading up process is witnessed by the fact that any farmer wishing to make rapid strides imports a sire, and this sire is sure to leave his mark for good or bad. Now there is no magic in the word "imported," though many appear to think so; it simply signifies that the animal has been well grown, and nearly always possesses a pedigree indicating purity of descent.

There is blood in this country equally as good as can be imported, though much of it has lost some value by successive generations being starved; other again that has proved itself

equal to resisting the strain of starvation, or that has been somewhat cared for, far exceeds in value any that can be imported; because here we have a guarantee—provided of course that excellence is present—that the blood is suited to the conditions obtaining, whereas the imported article may, or may not, be so suited.

But always must the farmer who is grading up remember the value of pedigree, and see that his animal sires are free from foreign or inferior blood, and he will find the South African Stud Book of great value to him provided always that its pedigree certificate signifies purity of blood, and not merely excellence of form alone. This suggests the question as to whether animals recorded in a pedigree should carry with them a certificate of merit as well as of blood, but though this has been shewn to largely influence the value of a pedigree, yet the question is so large and complex as to debar it from being discussed in this article.

On our shows, apparent merit is often placed in advance of purity of breed, whereas the fact should always be kept in view that a cross-bred is generally of more robust habit, and more taking in appearance, to the uninitiated, than a pure-bred, a fact which in itself is proof of the value of using pedigreed animals to grade up others. In breeding classes quality or purity of breeding should always be a *sine quâ non* for a prize animal. This not applying in the same way to classes where excellence for work or food is the immediate object in view. A quotation from a recent number of a breeders' paper may be not inappropriate: "When pure-bred animals, male and female, of one breed are mated, the result of the mating will be, in ninety-nine cases out of a hundred, closely similar to the parents, and if the one hundredth member is different it is merely a 'sport.'"

"Let it be remembered that I have said 'pure-bred' animals, and I mean pure-bred animals, not merely animals that have all the appearance of being pure-bred; for if one or the other parents has a foreign strain in its blood, then like does not always produce like. The animal which has a foreign strain in it is not pure bred, and consequently the rule quoted does not apply." In the old country the ordinary farmer rarely goes further than his market town for his sires, and still more rarely uses sires of a different breed to that he keeps, consequently there are many animals to be found that are pure of their special breed—in fact this is how the different breeds have been formed—but which can show no pedigree; these are never accepted as pure by careful men, the guarantee being lacking. No careful farmer here would think of importing one of these, yet the same farmer will often use a sire bred here that could show no pedigree, especially if the animal was good to look at; and this country probably stands first for indiscriminate mixing of breeds. Not until the true value of pedigree is grasped will the stock of the country show real progress.

MORE ABOUT CARP.

By D. E. HUTCHINS, F.R.Met.Soc.

In the Cape *Agricultural Journal* for July, 1904, I communicated a note on the cultivation in Cape Colony of the domestic Carp (*Cyprinus carpio*). I immediately received a flood of enquiries on the subject. One enthusiastic correspondent wrote:—

“Your contribution to the *Agricultural Journal* for July re *Cyprinus carpio* is the best thing that has appeared in that periodical for a very long time. I know the Carp at home, and have seen them bred in large dams and ornamental waters, connected with parks. Just before I left Germany I walked about 20 miles to purchase some Carp at Hundelshausen in Hesse-Cassel, where a large reservoir was drained for cleaning purposes. At an estate called Helmarshausen our friend there had an ornamental lake in his park with an island, Greek temple and boat, and also some poles covered with planks in the water, upon which all the offal of the game shot were placed, to feed the Carp.”

I hardly ever travel in the country without realizing what a resource it would be to farmers and landowners to have Carp in their dams and vleis, and during the last 18 months have put together the following further notes on Carp.

In my previous note I mentioned that Carp have many advantages over Trout. Instead of requiring the abundant water of running streams they like sluggish or muddy water, and when the water gets low in summer they seem to be able to hold out without difficulty. In England and in more severe inland climates the Carp hibernates in winter. It is said that in eastern Europe when the Carp ponds are frozen solid, the Carp lives in the mud underneath. It will do the same thing in the mud of vleis and dams here when the water gives out in summer. The common Goldfish is closely allied to the Carp. This also has the property of burying itself in damp sand and mud when the water gives out. Two years ago at Tokai it was necessary to sink in a water hole in the Prince Kasteel Stream to get water for a forest nursery. The river was dry at the time—it had ceased to flow for some time—but buried in the damp sand of the water hole were found live Goldfish. These were taken out and released in a dam where I saw them afterwards alive and well. The common Carp of Europe is an equally hardy fish. In Holland they take them out

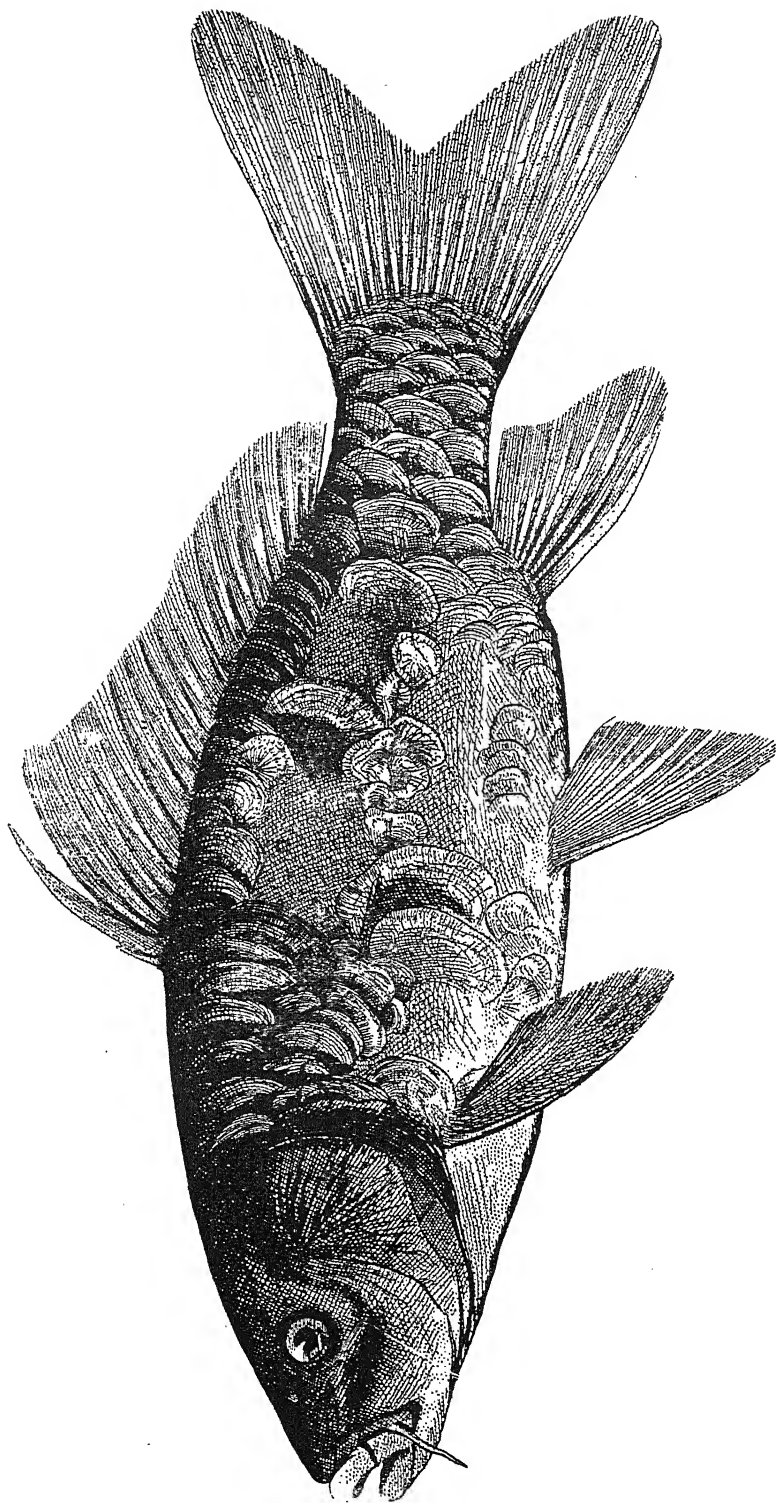
of the Carp ponds and keep them packed in moss and hung up in nets. They are said to require frequent dips in water at first till they get used to this treatment, but afterwards get on well and are fattened on bread and milk and lettuce! It is quite certain that they are commonly taken alive packed in moss to the markets in Holland, and those that are not sold are taken back alive to be hung up in the nets or returned to the ponds.

Though classed as coarse fish, Carp if properly cooked are most delicious eating; but one has to go to Germany or France to enjoy them. They must be *cooked*. Our ancestors ate them seethed or fried, but those were days when the railways did not bring abundant supplies of the choicest sea fish. In Prussia and in Austria landed proprietors still make a considerable revenue from their Carp ponds; and in the old days the Carp ponds of the monasteries were seen all over Middle Europe. The German landowner goes to trouble and expense with these Carp ponds and has different ponds for spawning, for young fry, and for rearing the adults.

Carp have small mouths and a bony palate, but few teeth. They make a curious sucking noise when they rise to a fly or any food on the surface of the water. They have been known to swallow minnows, so that they should take the small gold fish which often swarm in ponds at the Cape. The ordinary food of the Carp is stated to be insects, worms, and various water plants. Mine are fond of bread and brewers' grains. I have heard of a Carp in the old Botanic Gardens, Cape Town, which grew to a large size on the children's bread. Another point which has to be settled by experiment here is how Carp and Cape frogs will get on. Tadpoles swarm in winter, and should furnish the Carp with abundant food, but Carp breeders in Germany fight shy of frogs. There is an apparently authentic case of frogs injuring Carp in England. "On fishing in a pond in Dorsetshire great numbers of Carp were found, each with a frog mounted on it, the hind legs clinging to the back and fore legs fixed in the corner of each eye of the fish, which was thin and wasted."—(P. M. Duncan, F.R.S., F.G.S.)

The common Carp (*Cyprinus carpio*) occurs in Europe, China, and Japan. It is a comparatively small fish in England, but grows to a larger size in Southern Europe. A further good point about the Carp is that it will do well in brackish water. There are fine Carp in the Caspian Sea. Under favourable circumstances Carp will increase in weight at about the rate of one pound per year. There is evidence of their living to a great age—over a century—and in Southern Europe, where the temperature of the water is the same as in Cape Colony, rapidly become fine fish. Dimensions up to five and six feet are mentioned.

The Carp is a prolific fish, and if the conditions are favourable, will increase at a rapid rate and yield a good return. In "*British*



Carp bred in pond at Strubenheim, Rosebank, weighing $1\frac{3}{4}$ lbs. at 2 years of age.

Fishes," issued by the National Fish Culture Association, South Kensington, it is stated :—

"The culture of this fish in Europe dates back to the eleventh century, when it was introduced from Central Asia. The particular species recommended for acclimatisation, as food producers, are the *Cyprinus carpio specularis*, the 'Mirror Carp.' The *Cyprinus carpio coriaceus* or *nudus*, the 'Leather Carp,' deriving its name from its peculiar voidance of scales, but having a beautiful soft thick skin.

"The Carp is a hibernating fish, and, like other members of the *Cyprinidæ* family is an adherent spawner. It is well adapted for artificial ponds and lakes. It is a very rapid grower, and will attain the weight of 3 lbs in as many years, but its particular speciality consists in its delicacy as a good fish. It is estimated that a 4 lb. Carp will yield 400,000 ova.

"The Carp is distributed over the entire country, and there is hardly a district in Great Britain that has not Carp in the waters in more or less quantities. The Carp is no doubt a fish with much historic interest, and has been held in the greatest amount of estimation as a food-producing fish for several centuries. Remains of Carp 'stews' are to be found in most of the monastic grounds and manor houses of Great Britain. The Carp is said to live to a very great age, considerably over one hundred years; and mention is made of the fish in official records as far back as 1496. Carp is to be found in ponds, lakes, and rivers, and thrives best on rich loamy bottoms. The Carp spawns in the month of June. The ova is shed on weeds, stones, or trunks of trees. The average weight of the Carp is about three pounds, but it may attain to eight or nine pounds, and even twenty pounds. The food of the Carp is a mixture of both vegetable and animal matter. The Carp hibernates in the winter, and its greatest percentage of growth is in the summer months. The cultivation of the Carp has reached a complete science in Germany, and has become a source of considerable emolument to those who have entered upon 'Carp farming.' The species adopted by the German pisciculturists are the Leather Carp, the Mirror Carp, and the Common Carp. The former are much better."

CARP EAT MOSQUITOS.

Carp may play an important part in malarious countries where mosquitos are not only a nuisance, but act as spreaders of fever. Quite recently, there was an epidemic of mosquitos in Paris and the trouble became so bad that the municipality had to take action and frame regulations. Amongst other things, owners of ponds were compelled either to treat them with parafine or to stock them with fish. I had at one time a few mosquitos at my house at Kenilworth. Since I stocked my pond with fish I rarely hear a

mosquito and I sleep at an open window within a stone's throw of the pond. In the Government Forest at Ceres Road, where, as mentioned later, the attempt to stock the waters with Loch Leven trout has failed, mosquitos swarm. They come out at dusk, not in twos and three, but in dense black clouds! Those who attended the last of the evening lectures at the meeting of the British Association in Cape Town will remember the lantern slides shewing mosquito larvae hanging suspended from the surface of a pool of water.

CARP AT JONKER'S HOEK.

Last November I took an opportunity of visiting the Government Hatchery at Jonker's Hoek near Stellenbosch. Carp at Jonker's Hoek have proved an entire success. In a little shallow muddy pond, measuring about 26 yards by 5 yards and 4 feet deep, six Carp were put out three years ago. It now seems literally swarming with fish. Mr. Scott the Superintendent estimates that there are certainly over 100 there now, and some 150 have been distributed. It is possible also that the otters may have taken their toll, as there are otters here and this pond is not protected from them. I am thinking of the mischief wrought by otters in the larger water space, in spite of every precaution, in the government forest at Ceres Road. These Jonker's Hoek Carp look particularly large and robust, contrasting with the comparatively slender figures of the Trout in the adjoining pond. They appear to be about the same size as the Carp at Tokai, but they cannot be seen so well as the Tokai Carp, since they are in muddy water. It is evident that the Carp in this pond are breeding, since fish of all sizes are noticeable. The teeth of Carp are few, small and far back, and there is little fear of the older Carp turning cannibals and eating the younger as is the case with Trout. Scott thinks they will not even eat the spawn, but it is possible that this may get devoured with the weed, since it is deposited round the sides of the pond like frog spawn. Carp at Jonker's Hoek spawn about the end of November, and fry hatch out in two or three days, if the sun is hot. The appearance of Carp spawn is very like frog spawn. There is a notable difference in the fecundity of Trout and Carp. Carp, says Scott, will produce spawn at the rate of about 20,000 eggs per lb. weight of the fish, while Trout will not produce more than from 800 to 1,000 per lb. weight of fish!

There is no reason to suppose that frog injure Carp, as they have been stated to do in Europe; but Scott thinks that tadpoles may probably destroy the Carp spawn by eating it. Frogs have been seen to eat young gold fish in my pond at Kenilworth.

The Jonker's Hoek Carp is considered to be a first-rate eating fish. Scott holds the opinion that it is a cross between the King Carp and the Leather Carp, both choice table varieties. He adds

that Carp ponds are best not too deep, since deep ponds are not favourable to pond weeds and vegetation. He likes ponds not deeper than about 4 feet with a few holes here and there where the Carp can get shelter. Carp, he says, will remain alive in a dry pond provided the mud at the bottom remains soft. If that gets so dry that it cracks then the fish perish. I saw him feeding the Carp on chopped liver, but he says that they do equally well, or better, if fed on bread or soaked grain.

Carp at Jonker's Hoek are active throughout the year. In Northern Europe Carp become dormant during the winter. The hottest days at Jonker's Hoek when, the water rose to a temperature of 85° Fah., seemed in no way detrimental to the Carp, indeed, they seemed to come to the surface and enjoy the heat.

CARP IN THE CAPE PENINSULA.

Tokai.—Two years ago Carp from the Government Hatchery at Jonker's Hoek were placed in the nursery dam at Tokai. These have thriven amazingly. This dam is small, only about one-eighth of an acre in area, and varying in depth from four to six feet. The Carp put in there two years ago now average one foot in length. The largest of them are about one foot four inches long. They are of a healthy, plump appearance. They have had no feeding beyond a few bits of bread thrown in about once a week to keep them tame. The walls of this dam being faced with stone, and there being a fair stream of water running through it, the water in the dam is sufficiently clear for the Carp to be well seen. On throwing in a few pieces of bread a lover of fish sees a sight which delights him. There is one particularly fine, large fish. It is of a bluish colour, and shews the rough, leathery scales from which this fish—the "Leather Carp"—derives its name. From each side of the jaws project the barbels which are characteristic of Carp and other allied fish. The English Barbel gets its name from these barbels. The barbels certainly add to the appearance of the fish, and are believed to help it in finding its food along the dark muddy bottoms, where the Carp gets its food. The mature Carp has four barbels, two long and two short.

There were formerly Carp in the circular pond behind the Convict Barracks at the Tokai Manor House. But these were not the eating Carp, and are said not to have been larger than eight or nine inches. Mr. Lister describes them as having a muddy taste. Some of these fish were eaten by ducks and the rest probably killed when the pond was filled in.

Strubenheim.—At Strubenheim, Rosebank, is a piece of ornamental water half an acre in area and averaging some seven or eight feet deep. Carp were put in here two years ago. The success of these fish is equal to those at Tokai. They have grown and multiplied in an even more striking manner than those at Tokai and the

Government Carp Ponds at Jonker's Hoek. Some of Mr. Struben's fish are equal to the largest of those I have seen at Tokai or at Jonker's Hoek. They also have had no regular feeding—practically no feeding at all. They have fed themselves on the weed in the pond and on the flies, frogs, mosquito larvæ, etc., that infest fresh water in this country. There are probably about 100 fish now in Mr. Struben's pond, all healthy, well-grown and particularly active.

Kenilworth.—The Carp in my little pond at Kenilworth were mentioned in my note on Carp in the *Agricultural Journal* of July, 1904. A dozen Carp from Jonker's Hoek were put into this pond two years ago at the same time as the Carp at Tokai and at Strubenheim. In this small piece of water they have grown nearly as fast as at Tokai and Strubenheim. Last summer I was enlarging the pond and let the water shrink to little more than a puddle. No dead fish were observed, and as far as I have been able to judge since the pond was again filled up all the original fish are alive and well. There is no evidence of breeding, probably because the gold fish and frogs have eaten up the spawn. Next year, before spawning time, I intend to put some of the Carp into a pond where there are no gold fish. I shall also kill off most of the frogs and feed well what are left at spawning time, so that they may be less inclined to eat the Carp spawn. Frogs eat young gold fish, but probably young Carp would be too active for them.

Woodstock.—Mr. Solly, of Sir Lowry's Pass, tells me that Carp existed for long in a pond on the site of the present gas works at Woodstock. This pond yielded good eating fish for many years. The fish were eventually killed off by gas refuse.

Cape Town.—There were originally a pair of Carp in the Botanic Gardens, Cape Town. One of these attained a large size and was lost under the following circumstances:—The pond was being cleaned out, and the fish was placed temporarily in the small central water basin. One morning it was found to have jumped out of this and to be lying dead. With this pair of Carp there were Goldfish, and Mr. Chalwin, of the Botanical Gardens, is of opinion that the Carp and the Goldfish crossed, owing to there being amongst the Goldfish so many with a half-bred look. These Goldfish were subject to a fungoid disease, which caused them to break out in pustules. Sometimes the flesh of the back of the fish comes off entire, leaving gaping sores. This disease is worse in winter when the water is not so often renewed as in summer. The space in this basin is perhaps too confined for healthy fish without frequent renewal of the water.

CARP IN THE CERES ROAD FOREST.

Carp from Jonker's Hoek were put out in the Ceres Road forest at the same time as Tokai. The water here, however, is several acres in extent, and little has been seen of them since. The area

of the new reservoir there is $2\frac{3}{4}$ acres. They are protected from otters by a wire netting fence, and are believed to be flourishing. Carp are now being placed in a smaller dam where they can be better observed, and where there is a particularly good supply of water-weed fodder.

CARP AT CARNARVON FARM.

Messrs. Halse Bros. last year put a small supply of carp in the large dam or lake at Carnarvon farm. A further supply is being put in this year.

CARP AT ZOETENDAAL'S VLEY.

This is believed to be the largest sheet of permanent fresh water in Cape Colony. It is a shallow lake near Cape Agulhas, about fifteen miles in circumference. After the recent droughts, the level of the lake fell, the water became slightly brackish, and the large "Springer" fish, for which it is famous, became scarce. The water is now high again, and when I visited Zoetendaal's Vley recently the water was, to the taste, quite fresh. Steps are now being taken to introduce Carp to Zoetendaal's Vley and the adjoining waters.

CARP AT BEAUFORT WEST.

Some years ago the late Mr. Fairbridge, of Sea Point, imported Carp, and distributed them to various centres in Cape Colony. Mr. J. H. Goodrick, the Town Clerk of Beaufort West, has kindly favoured me with particulars regarding the fish sent to Beaufort West by Mr. Fairbridge, and those subsequently placed in the dam by Mr. E. F. Jackson (now of Schilder's Pan, Britstown,) in the early seventies.

"Carp and ordinary river fish from the Gamka River abounded for many years in the Beaufort West dam, and only became extinct owing to the frequent drying up of the dam in late years. When the dam completely dried up in 1883 a number were put into the fountain and restored to the dam when it refilled. At the first complete drying-up of the dam they were lying in great numbers on the mud and in the shallow muddy pools. I do not think they thrived as well in the fountain as in the dam, since the number put back was less than that taken out of the dam. This may, however, have been owing to the hardness of the fountain water, careless handling, or the greater facilities for torment and destruction by those frequenting the fountain. There seems to be little doubt that had the dam not dried up so frequently, the Carp would still have been there, as they seem to have increased fairly well on being returned to the dam from the fountain."

It is believed that the river fish from the Gamka River kept down the number of Carp, and the man who put in the river fish

regretted having done so. Nevertheless, it was observed that the Carp continued to increase. Mr. Madison cites 5 lbs. as the largest Carp known to him. Mr. Goodrick has not seen Carp above one and a half or two lbs.

Mr. Madison states that Carp were also placed in the Beaufort West dam by Mr. James Jackson and Dr. H. W. Drew about 1870, and they were there for thirty-three years, until the complete drying-up of the dam in September, 1903. The dam had previously dried up in the latter part of 1883, when the Carp were saved, as has been mentioned, by being put in the fountain. In 1903 they were finally lost. In the intermediate dryings-up there was always enough water in puddles and wet mud to keep them alive.

It appears that the Carp placed in the Beaufort West dam by Mr. Jackson came from Houw Hoek, Caledon Division. Writing under date 7th March, 1906, Mr. J. D. Jackson says: "My father brought down about thirty Carp by cart from Houw Hoek, Caledon Division, in June, 1869, and placed them in the dam at Beaufort West. They thrived well, but most of them were washed away when the dam burst some years after this." These Houw Hoek Carp were, no doubt, some of those common English Carp that have existed in ponds near Cape Town for many years.

These Beaufort West Dam Carp had a muddy taste, and, according to the Town Clerk, were never used as an article of food, except by the convicts employed in cleaning out the dam; and it is believed that the final disappearance of the Carp was due to the convicts' attentions. This took place when the dam was very low, and was the only time when the Carp were caught and eaten. Another account says that the Carp were regularly caught and distributed when the water of the dam ran low. This was before the days of railways and sea fish. It is said that these fish would not take bait and no seine fishing was allowed. There was no perceptible brackishness in the Beaufort West water, but the water has been at times so bad as to make the water in the spring undrinkable. Mr. Goodrick mentions that when Sir Henry Loch was at Beaufort West a few years back his A.D.C. asked Mr. Madison to get him some of the fish, which he did. It is believed that some of these fish were placed in the Liesbeek River in the Cape Peninsula, and some sent to Dr. Atherstone at Grahamstown, where they were reported to have done well for a time. Others were sent to Groot Vlei in the Nieuweveld.

Other accounts speak of the Beaufort Carp in even more favourable terms, describing their rapid increase, and stating that their eating qualities were good—possibly some of those good eating qualities were such as attach to the proverbial sweetness of stolen things! No doubt, as is usually the case with Carp not specially fattened, the quality of the cooked fish depended largely on the cooking!

CARP IN ALGERIA.

Carp were introduced into Algeria as far back as 1858* when the *Société d'Acclimatation* sent a barrel of Carp to Constantine. Trout ova were sent at the same time. They hatched and were turned out in the Rummell but failed owing to the water containing too much lime in solution. The Carp were put out in some ponds near Constantine and succeeded at once. Carp and Tench were subsequently put into ponds and dams in the province of Algiers where they thrive well and were shown at the Paris Exhibition of 1867. Certain waters in Algeria containing salts of Magnesia in solution have been found unsuited to Carp. In such waters the fish are lean and of inferior quality generally.

Algeria is poor in indigenous fresh water fish. The rivers are too often muddy torrents in winter and dry in summer. Two Barbels (*Barbus callensis* and *B. sitifensis*) are abundant. They have a muddy flavour and it has been remarked that the largest fish are commonly the worst tasting.

The European Eel is common everywhere in Algeria. This and the muddy Barbels are practically the only fresh water food fishes of Algeria, for the one fine fish—the Algerian trout—is confined to the mountain streams of Kabylia.

INCREASE OF CARP.

There may be a few young carp in my pond at Kenilworth : young Goldfish before they turn red and young Carp are not easy to distinguish in muddy water. This is a point that will be seen later. Mr. Struben, like Jonker's Hoek, has clearly got Carp of all ages : Tokai is still uncertain.

To breed Carp as a business, one wants three ponds : (1) A small breeding pond : (2) A living pond which may be as large as is convenient for manipulation and (3) A small fattening pond.

These separate ponds are, however, not so necessary as in the case of Trout breeding, since Carp do not prey on one another. And it is quite easy to leave young Carp in a state of nature and just catch a fish when you want one for the table. It is convenient to accustom the Carp to be fed in a corner of the pond which can be cut off from the rest of the pond, and from whence the big fish can be taken out with a landing net. Carp soon get tame and will come at once to any corner where they are accustomed to be fed.

CARP IN BRACKISH WATER.

Zoetendaal's Vlei, as I have mentioned, becomes slightly brackish at times, and then the fine native fish there termed "Springers" are observed to deteriorate in size and diminish in quantity. Brackish water is indeed fatal to many freshwater fish,

but it does not appear to injure Carp which live naturally in water as brackish as that of the Caspian Sea. Duncan speaking of Carp generally, says, "it does well in brackish water and attains a large size in the Caspian Sea."

CARP IN DRY MUD.

Many fish are known to hibernate in these climates in dry mud exactly as they do in winter during the rigours of colder climates. Many more, no doubt, hibernate in times of drought without the fact being generally known. Fish sometimes reappear in vleys that have been dry for years. The African mud-fish *Protopterus annectans*, a zoological curiosity, has been taken alive to England, enclosed in balls of hardened clay in which the fish hibernate and remain torpid during many months of the year, with a small hole in the clay at each end to admit the air. "They are abundant in the rice fields, where they are dug out of the mud by the natives who regard them as a delicacy." (Duncan). It may be noted that snails regularly hibernate during winter in cold countries, and during the dry season in warm countries. In summer in the Cape Peninsula, snails may be observed in a torpid condition in old pots and under stones, their shells sealed down tightly. If a pot of such sealed-up snails be taken to a cool place and watered, the snails will unseal themselves, come out, and feed.

THE CARP IN EUROPE.

Whether the Carp was originally a native of England, is not known. "It certainly existed in England before the Sixteenth Century. It is mentioned in the famous 'Boke of St. Albans,' in 1846, by Dame Juliana Barnes, as a 'dayntous fysshe, but scarce.'" (Chambers' Encyclopædia.)

The Carp does not grow to a large size in England. A fish of 18 or 20 lbs. is there looked on as a rarity. Professor Pearson tells me that there are big Carp at Emanuel College, Cambridge, which can be identified by rings in their tails as being 200 years old. These old fish have been brought to light from time to time, when the water was let out for cleaning purposes. They are said to be about three feet in length, and to be somewhat troubled with fungus. In Middle and Southern Europe, Carp grow to a much larger size. A case is cited of a Carp being taken near Frankfort-on-the-Oder in Germany which weighed 70 lbs., and was nine feet in length. A Carp of such a size, as large as a very big shark, sounds incredible. It was an exceptional monster; but Carp of 30 lbs. and 40 lbs. are said to be not at all rare in some of the German lakes. In Austria and Germany many lakes and ponds are let at high rentals for the sake of the Carp which they contain. Here the summer tempera-

tures are higher than in England, resembling the summer temperatures in Cape Colony. Hence the importance of getting Carp from Southern Europe for Cape Colony. I have met with numerous fish hatcheries in Germany. Here is an official account of a fish hatchery in Italy:—

FISH HATCHERY IN ITALY.

Since 1894, the Marchese Luigi Torrigiana has undertaken on his farm, called Panna, the artificial breeding of Trout. The small aquarium is divided into five compartments, first, the incubation room, capable of incubating 200,000 eggs; the second consists of several small canals, where the young fish pass the first period of their growth; the third department consists of a large pond in the shape of a lozenge, where the Trout are kept until they complete the second year of age, after which they are allowed to pass into the fourth department, which is a large lake; here they complete their third year, and in December fishing for sale is carried out. The fifth department consists of a series of small ponds to separate Trout of various growths and qualities. The varieties bred are the *Salmo fario*, or common Trout, the *Salmo lacustris*, the *Salmo fontinalis*, and the *Salmo iridens*.—"British Parl. Report on the Industries of the Province of Florence." By Consul General Percy Chapman).

ARTHUR YOUNG ON CARP.

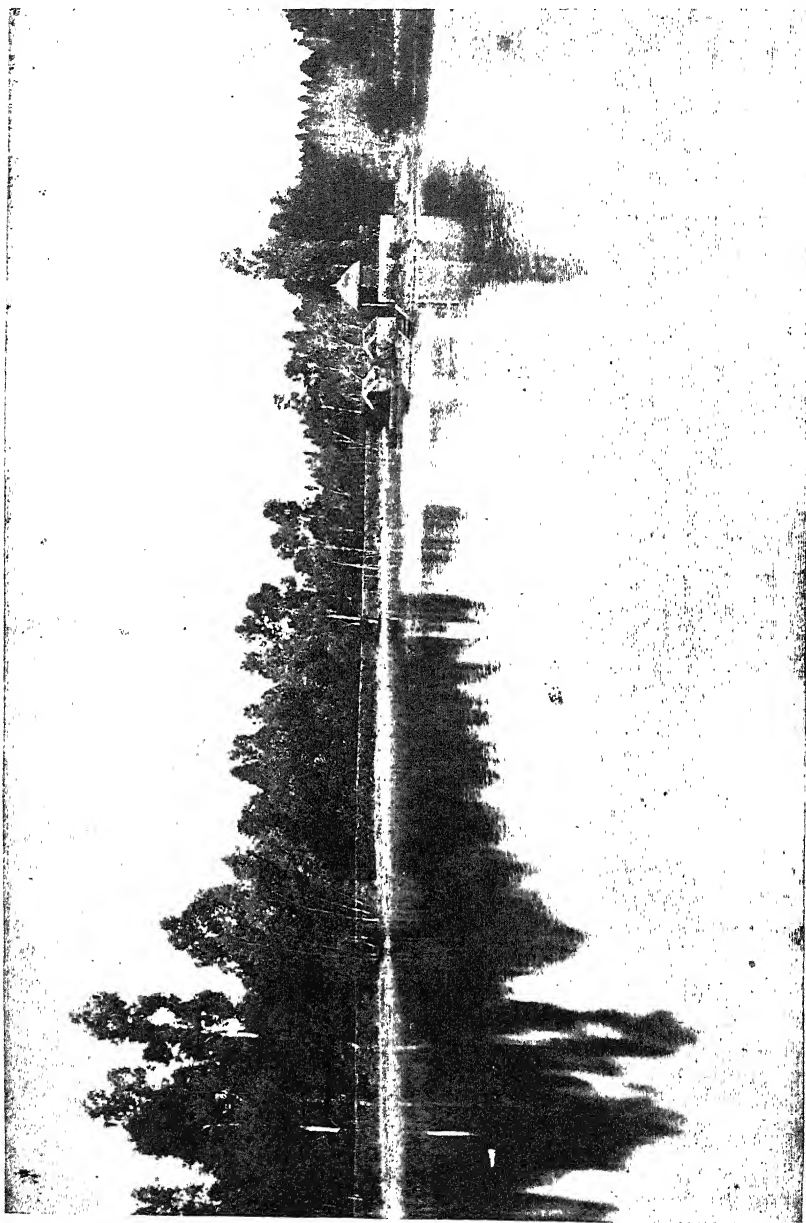
Arthur Young, who travelled in France at that interesting period, when the French Revolution was coming to a head, has in his diary the following references to Carp in France. Arthur Young was an excellent judge of a good dinner. The reader will note his warm commendation of these French Carp, and his condemnation of the too often fishless dinner of Englishmen.

"The estate of Verteuil, in the valley of the Charente, came by a Mademoiselle la Rochefoucauld, in 1470. The park, woods, and river Charente here are fine; the last abounds in Carp, Tench and Perch. It is at any time easy to get from 50 to 100 brace of fish that weigh from 3 to 10 lbs. each: we had a brace of Carp for supper, the sweetest, without exception, I ever tasted. If I pitched my tent in France, I should choose it to be by a river that gave such fish. Nothing provokes one so in a country residence as a lake, a river, or the sea within view of the windows, and a dinner every day without fish, which is so common in England.

After passing three miles through the forest of Fountainebleau, arrive at that town, and view the royal palace, which has been so repeatedly added to by several kings, that the share of Francis I. its original founder, is not easily ascertained.



Carp Waters at Ceres Road.



Carp Waters at Ceres Road.

In the pond that joins the palace of Fountainbleau are Carp as large and as tame as the Prince of Condé's.—(Arthur Young's *Travels in France*.)

When Arthur Young entertained his friends at his country house in England he gave them Carp for dinner. Miss Betham Edwards his biographer describes the scene in these words :—

“The Burneys were, of course, frequent visitors at the pleasant country house described in *Camilla*. Occasionally the too hospitable host—for although now owner of the maternal estate. Arthur Young was far from rich—would give a fête champêtre. At an early hour the guests arrived. The fish ponds in the park were dragged, and after a long animated morning spent by both sexes out of doors, the party sat down to a four o'clock dinner, degustating the fish just caught.”

In Germany, says Duncan, “the Carp is regarded with a degree of epicurean appreciation which finds no parallel in England.” But we must remember that some of these German Carp are regularly fattened for the table, like the farmer fattens his pigs and ducks. The practice with Carp, and also the domesticated Tench, is to put them in clear water, away from the mud they love, and to feed them on meal. Indeed the Germans sometimes go so far as to caponize their fattening fish like cockerels. Carp spawn in early summer, and are lean, coarse, and out of season for some time afterwards.

CATCHING CARP.

The domesticated fish of Carp ponds and stews is taken as wanted with a net. The wild fish of lakes, ponds, and calm rivers may be netted or taken with a rod. In England ground bait is used—bread paste, grubs, flies or meat maggots (gentles) ; but catching Carp in this way is usually a slow process, though the fish when hooked fights gamely. In a state of nature the Carp seeks his food along the bottom and is perpetually stirring up the mud while feeding. When domesticated and accustomed to artificial feeding, he rises to the surface like a trout and takes his food with a rush and a snap which can be heard as well as seen ! Mr. Struben has taken Carp with a fly at Strubenheim. He finds they rise readily to a fly. It is mentioned that in the Danube when torpid during winter, the Barbel is netted or even taken by hand. In Cape Colony, as far as my observations go, the Carp has no torpid period during winter, and thus could not be taken in this way.

THE “PESTE ROUGE” OF CARP.

A writer in the *Revue des Eaux et Forêts* for July, 1904, draws attention to a disease which attacks both Carp and Tench in Europe. He terms it “*purpura*” or “*peste rouge des Cyprinida*.” It gets its name of “red sickness” from the red

colour of the fish affected with it. Sometimes ordinary Carp which have got the sickness scarcely shew any colouration, while, on the other hand, the speckled variety and leather Carp are often strongly coloured with red about the eyes, fins, and all the white ventral portion of the fish. This sickness has been observed at numerous places in Germany, and usually attacks fish kept crowded and in a dirty state in small ponds. It is simply a disease of dirt and over-crowding, and sometimes the fish will recover by simple removal to clear running water.

The disease is due to a bacteria termed *Bacteria cyprinicida*, which can be easily isolated and cultivated on gelatine.

Carp being a fish which is so easily transported long distances, some special precautions would seem advisable to prevent the importation of this disease to South Africa, where with the mild winters it might run riot. A few years ago the trout fungus unfortunately got into the Government hatchery at Jonker's Hoek. This is believed to be now stamped out, but here we have to do with clear running water. The task might be more difficult in the still water suited to the Carp.

MARKET PRICE OF CARP IN FRANCE.

The following are the latest official returns, January, 1906 :—

Average market price per lb.

			s.	d.		s.	d.
Lobster ...	...	...	1	0	to	2	1
Trout ...	...	...	1	1	„	2	0
Turbot ...	...	...	0	7	„	1	8
Soles ...	...	...	0	7	„	1	6
Carp ...	...	...	0	7	„	1	1
Barbel ...	...	...	0	5	„	0	8
Tench ...	...	...	0	4	„	0	7
“Escargots” the 1,000	...	...	4	2	„	13	4

—(*Ministère de l'Agriculture Bull. mens.*)

According to this return the average price in France of the best Carp is 1s. 1d. per lb. which is equal to that of the cheapest Trout, while best Trout sells for nearly double this price.

THE CRUCIAN CARP (*Carassius vulgaris*).

Before we pass on to glance briefly at a few other fish worthy of introduction along with Carp to South African waters, mention must be made of the Crucian Carp. This is a stouter, broader fish than the real Carp. Its habitat extends from Italy to Siberia. It occurs in the Thames in England, and is cultivated on the Continent of Europe, where several varieties are known. Dr. Günther looks on the Prussian domestic Carp as a lean variety of

the Crucian Carp. In the northern hemisphere "it spawns in June, when the fish assemble together in great numbers. In Siberia it becomes torpid in winter, and is said to survive in the mud even when the lakes freeze to the bottom" (Duncan).

CARP-LIKE FISH.

Allied to the Carp and common in British waters are:—(1) The Chub and Barbel, classed as species of Carp and called *Cyprinus cephalus* and *Cyprinus barbùs*; (2) the Perch (*Perca fluviatilis*); (3) The Tench (*Tinca vulgaris*), with the golden variety introduced into England from Silesia in 1867; (4) The Roach (*Leuciscus rutilus*), and the copper-coloured Roud of Norfolk (*Leuciscus erythrophthalmus*); (5) The Bream (*Abramis brama* and *A. blica*); (6) The Goldfish (*Carassius auratus*). All these are fish of still or muddy water. They feed on water-weed, on flies and insects in the water, and on the worms and insects which they find in the mud at the bottom of the water. The Carp and Barbel, and some others, are provided with cirri or barbels, which assist them in finding their food in muddy bottoms. The Barbel gets its name from these barbels. I have noticed them well developed in the Carp at Tokai. The genus *Carassius*, to which belongs the common Goldfish differs from *Cyprinus* in the absence of barbels.

For domesticating in dams and slow-running water, the best of these after the various kinds of Carp is perhaps the Golden Tench, a stout handsome variety of the common Tench. It is cultivated entirely for eating purposes in Silesia, and was introduced comparatively recently into England, viz., in 1867. The ordinary Tench is a common lake fish in France, Germany, and Austria. The domesticated fish is fattened for the table by being put into clear water, and fed on meal. It is the only species of the genus. The little Dace is said to be the most delicate eating of the Carp family (*Cyprinidæ*), the Roach, one of the most inferior, but the Dace likes clear water and quiet streams. Both of these are small fish, rarely seen above eight or nine inches long in England. Of the two belonging to the genus *Cyprinus*, the Chub is usually seen in clear water, but its meat is coarse and poor: and the Barbel is equally inferior for eating. The Perch was "well known and esteemed by the ancient Greeks and Romans." The brilliant little Minnow also belongs to the *Cyprinidæ*. It is worth cultivating and introducing to South African waters on account of its value for feeding Trout and the older Carp. In Europe it is not found south of the Danube, so that there are climatic reasons against its successful introduction to South Africa.

Goldfish (*Carassius auratus*) never grow large enough to make it worth while cultivating them for the table. According to Duncan, no specimens are known to exceed a foot in length.

Originally, introduced from China about 200 years ago they are now naturalized in the Mediterranean countries and other extra-tropical regions. In South Africa they are quite hardy when placed in a pond or water hole by themselves, but in larger waters where the native fish abound they do not increase on any large scale, and often disappear. They are sluggish in their habits and soon full a prey to their enemies. In my pond even frogs catch and eat small Goldfish. I expect that as the Carp increase in size they will take to eating them if they do not do so already. A possible danger may be the crossing of the Carp and the Goldfish, for Carp and Goldfish are closely allied, the absence of barbels putting the latter into the genus *Carassius*: *Carassius vulgaris* the Crucian Carp readily crosses with the common Carp: various hybrids of the Bream and Roach, are met with in nature.

"Blancard states that in the rivers of France, Goldfish lose their colour. In the manufacturing districts in England they are often kept in the ponds in which the water from the steam engine is allowed to run off and cool. Here the temperature is often about 80° Fahr., and Yarrel records that the fish breed more readily under such circumstances than when exposed to variations of temperature. Three pairs of fish put into one of these warm ponds had, in three years, so increased in number that they were taken out by the wheel-barrow- full." (Duncan F.R.S.)

As will be seen below, it was stated at the meeting of the British Association in Cape Town that Goldfish introduced by man to Madagascar are spreading and replacing the native fish.

In the extra-tropics Goldfish may fitly be varied by some of the more beautiful Cichlids of the Argentine and South America. They are allied to the common Perch, but most brilliantly coloured and far more lively in their habits than our old friend the sluggish Goldfish. Some of these fish belonging to the genus *Cichlasoma* were recently on show at the Zoological Gardens, London. Says Dr. Pelegrin—*Rien ne saurait dépeindre la vivacité les teintes agréables et charmantes de ces gracieuses petites espèces* —(*Bul. de la Société d'Acclimatation*.)

Carp are common in tropical Africa, all members of the sub-family of *Cyprinidæ*, a few genera, but a considerable number of species. (J. Pellegrin).

CYPRINIDÆ AT THE BRITISH ASSOCIATION.

The Carp, the Tench, the Roach, the Rudd, the Chub, the Bream, the Barbel, the Gudgeon and the little Dace and Minnow are familiar English fish belonging to the great family of the *Cyprinidæ*—a family of fresh water fishes comprising over 100 genera.

At the recent meeting of the British Association in Cape Town, the President of the Zoological Section, G. A. Boulenger

F.R.S. in his opening address on African Fresh-water fishes gave the following interesting sketch of the Cyprinids and of their precursors the Characinids.

The Characinidae.—This is one of the larger groups of African fishes, with ninety-three species, referred to twenty genera, mostly from the Nile and Tropical Africa as far East as the great lakes, but only very sparsely represented in East and South Africa.

One of the most striking features of the South American fresh water fish-fauna is the extraordinary number and the variety of forms of the *Characinidae*, unquestionably one of the most lowly and generalised groups of exclusively fresh water Teleosts. There occur in that part of the world as many as 500 species (about two-fifths of the whole fresh-water fish-fauna), divided among some sixty genera. The carnivorous forms predominate, but the herbivorous or semi-herbivorous are also very numerous. The latter would evidently compete with the Cyprinids, their near but more specialised relatives, which are so numerously represented in North America; and it is a remarkable fact that not a single Cyprinid is known to extend further south than Guatemala.

Although palæontology has taught us nothing respecting the Characinids, we have reason to assume, from the morphological point of view, that they were the precursors of the Cyprinids, which, we know, were already abundantly represented in North America and Europe in Lower Tertiary times, when the Isthmus of Panama was under the sea. When, in the Miocene, North and South America became re-united, the waters of the latter part of the world must have been already so fully stocked with the Characinids as to prevent the southern spread of Cyprinids. This is the only explanation that can be offered of the total absence of Cyprinids in South America, considerations of climate being of no avail in view of their distribution all over Africa. If, therefore, the Characinids existed in profusion in South America before the Miocene period, we are justified in claiming for them a high antiquity, and by putting it at the Upper Cretaceous we need not fear going too far back.

The Cyprinidae.—These fishes, as mentioned above, are very closely related to the preceding, and there is every reason to believe the former to be derived from the latter. Their least specialised genera (*Catostomine*) are now found in North and Central America (about sixty species), whilst three species, referable to the same genera, inhabit Eastern Siberia and China. These *Catostomine* are known to have had representatives in the Eocene of North America, whilst the more specialised *Cyprinidae*, which constitute the great bulk of the family both in the New World and in the Old, have left remains in the Oligocene and later beds in North America and Europe. It is therefore, highly probable that the Cyprinids originated as a northern offshoot of the South and Central American Characinids, and thence spread to Eastern Asia, at least as early as

the Upper Eocene. By the time (Miocene) they had reached India, where they now form the great majority of the fresh-water fishes, Africa had been connected with it by a wide belt of land, and no obstacle prevented their western extension. This comparatively recent migration accounts for the practical identity of the genera and the often very close affinity of the species of the Cyprinids of India and Africa. At the same period the land-area connecting India and Africa with Madagascar had disappeared, and the Cyprinids never reached that great island, where no doubt they would have thriven, if we judge by the results of the introduction by man of the *Gold-fish*, said to be in process of strongly reducing the numbers of the native Malagasy fresh-water fishes with which it is in a position to compete. Competition is always an important factor in the distribution of a group of animals, and the confinement of the Characinids to the waters of the western and central parts of Africa at the time of the immigration of the Cyprinids from the East must be the explanation of the comparative abundance of the latter and the scarcity of the former in those parts of the Continent east of the Rift Valley, which are not drained by rivers flowing from the central parts. The Cyprinids must have spread more rapidly than the Characinids, and being also less partial to heat they have thriven in the waters of South Africa, where at present only two species of Characinids—both carnivorous forms—are known to extend south of the Zambesi system. Of the 202 species recorded from Africa thirteen are found in North-west Africa, sixty-three in East Africa (exclusive of the Zambesi) and twenty-one in South Africa.

Africa south of the Zambesi system has a poor freshwater fish-fauna, but this is easily accounted for by the intermittent character of most of the rivers. The list I have drawn up from available data includes only fifty species, seven of which are partly marine. When discussing the distribution of the South African freshwater fishes eight years ago, Prof. Max Weber compiled a list of sixty-four species: but this included a number of truly marine forms, occurring only in estuaries, besides a few of very doubtful determination, which I am obliged to leave out. The majority of the exclusively fresh-water fishes are Cyprinids, viz., seventeen *Barbus* and three *Labeo*. Characinids are represented by the widely distributed *Hydrocyon lineatus*, which occurs in the Limpopo, and the newly discovered *Alestes natalensis*, from near Durban. Three *Clarias*, a *Eutropioides*, a *Gephyrogobius*, and a *Galeichthys*, the latter semi-marine, represent the Silurids. The two *Galaxias*, as distinguished by Castelnau, the most remarkable type of the South African fish-fauna, and the two *Anabas*, are confined to the south-western district of Cape Colony. A Cyprinodontid of the genus *Fundulus* has been described from False Bay. Four Gobies and five Cichlids of the genera *Hemichromis*, *Paratilapia*, and *Tilapia* complete the list.

Poor as it is in fishes, the south-western district—the Erica or Protea district of Prof. Max Weber—derives a special character from the presence of the genera *Galaxias* and *Anabas*. The western district is also poor, and has only representatives of three families: Cyprinids, Silurids and Cichlids; whilst the eastern district, from the Limpopo system and the Orange River to Natal, is the richest, two families, Characinids and Gobiids, being represented, in addition to the three above named. The recent discovery in the Vaal River of a *Gephyroglanis*, a Silurid genus otherwise known only from the Congo and Ogowé, deserves notice.

Whether the subterranean reservoirs of the Kalahari are inhabited by fishes, as is the case in the Northern Sahara, is still unknown.

Excepting such forms as are believed to have been directly derived from marine types, there is every reason to regard the piscine inhabitants of the fresh waters of South Africa as comparatively recent immigrants from the North.

It is extremely remarkable that the great island of Madagascar, which in most groups of animals shews so many striking features, should in its fish-fauna be one of the most insignificant districts in the whole world. For, if we exclude the numerous Grey Mulletts and Gobies, and a few Perches of the genera *Kuhlia* and *Ambassis*, which live partly in the sea, and probably mostly breed in salt water, the truly fresh-water fish-fauna is reduced to sixteen species—viz., two Silurids, two Cyprinodontids, one Atherinid, four Cichlids, and seven Gobiids, the latter, no doubt, recent immigrants from the sea. The Silurids belong to two distinct genera, *Læmonema*, allied to the African *Chrysichthys*, first discovered in Mauritius, and *Anacharius*, allied to the marine or semi-marine *Arius*, and, perhaps, also entering the sea. Of the four Cichlids, two belong to a very distinct autochthonous genus, *Paretroplus*, whilst the two others are respectively referred to the African genera *Tilapia* and *Paratilapia*. The two Cyprinodontids belong to the widely distributed genus *Haplochilus*.

In concluding this sketch, whilst looking back with satisfaction upon the rapid progress which African ichthyology has lately made, and expressing our gratitude to the Governments, institutions and collectors, to whom we owe this progress, we cannot abstain from pointing out how much remains to be done. All the great lakes are insufficiently explored, and Bangweolo has never been fished for scientific purposes, whilst within the limits of this Colony an extensive collection from the Upper Zambesi is still a desideratum, and Lake Ngami is drying up without any of its fishes having been secured for study. The fishes of the Congo above Stanley Falls, and of many of its northern and all of its southern tributaries, are still unknown. But it is gratifying to observe the ever-growing interest in this hitherto somewhat neglected branch of zoology, and

I may express the hope that the next decade will be productive of even greater results than have been achieved within the last.

(G. A. Boulenger, F.R.S.)

TROUT.

With Carp it is often convenient to try lake Trout in the clearer larger sheets of water. Here naturally Italian lake Trout are those that should first be tried. Such northern fish as Loch Leven Trout seem to succeed in some places, at any rate for a time. Mr. Logan, in his numerous dams and reservoirs at Matjesfontein and Tweedside, has some promising Trout. In the more abundant but warmer waters of the Government forest at Ceres Road, Loch Leven Trout seem to fail at once. Here we have five branches of the head-waters of the Breede River, numerous deep pools and two large dams of water. There is clear running water at all seasons of the year. A good supply of Loch Leven Trout were put in six years ago. None were ever seen afterwards.

TROUT AT JONKER'S HOEK.

At my recent visit to the Government Fish Hatcheries at Jonker's Hoek I was shewn three kinds of Trout: (1) the Californian or Rainbow Trout (*Salmo iridens*), (2) the common brown Trout (*S. fario*), and (3) the Loch Leven Trout (*S. levenensis*). Mr. Scott, the Superintendent of the Government Hatcheries, is of opinion that the Loch Leven Trout is not a permanent variety, and that after it has been turned loose in rivers it reverts again to the ordinary speckled brown Trout.

I saw these three kinds of Trout in various sizes, from fry no bigger than small Minnows to the big Trout in the breeding ponds, which average about 2½ lbs. The largest Trout ever raised there was one of 8 lbs. This jumped out of the water and was found lying dead. Possibly it may have contracted disease at the time of the fungus trouble.

Of these three kinds of Trout it is probably the Californian Trout that has the greatest interest for South Africa. Californian Trout have been here for the last eight years during the twelve years that Mr. Scott has had charge of the fish. He thinks that the Californian Rainbow Trout is likely to do better in Cape streams than the North European Trout. It is stated, however, that Californian Rainbow Trout introduced into the Black Forest in Germany ate all the native fish, and then made their way to the Rhine and the sea, none of them ever returning to the Rhine or to the Black Forest streams! Those who remember the delicious native Trout in the Black Forest will not shed tears over the disappearance of the Californian Trout from there. In Natal they tell a similar story. Several batches of Rainbow Trout have been

liberated in Natal rivers during the last two or three years. All have disappeared. Mr. Scott says the Californian Trout is a more game fish, the North European fish getting noticeably lazy in hot weather, in this respect contrasting with Carp, which do not seem in the least to mind the heat. The water in the fish ponds at Jonker's Hoek has risen as high as 85° Fahr.

Rainbow Trout, in a cement dam at Tweedside, are thriving apace. They are considered to be growing faster than the Loch Leven Trout. Put in by Mr. Logan an inch long a year ago, they are five inches long now, 1905. There are Loch Leven Trout over a foot long after four years in the Tweedside dam, much speckled, longer than the ordinary Trout, and with a look of Pike. None of these fish are fed. The dam is shallow, and about one quarter of an acre in extent.

The culture of fresh-water fish, but particularly Trout, forms part of the course of instruction at the Nancy Forest School. Mr. Lane-Poole, a forest student, who has recently joined the South African Forest School from Nancy, tells me that the cultivation of Rainbow Trout is now in great favour in France, there being more demands for the fry than can easily be satisfied. Some years ago Rainbow Trout were by no means popular in France.

VORACIOUS OLD TROUT.

A recent writer in the *Field* gave a startling description of some of the old Trout recently turned loose at Hex River. He stated that they are now big $5\frac{1}{2}$ lb. fish, with head and teeth like a pike, and that after having destroyed the native fish, they are now eating the smaller Trout. Scott told me that small native fish were abundant in the Jonker's Hoek River, but they have now been so eaten by the Trout that they are now rarely seen. This has been confirmed to me by others who have recently fished in the Hex River.

CLIMATICALLY SUITED FISH.

If all the Carp hitherto introduced to South Africa were to fail, that would be no argument against the introduction of climatically suited fish.

The great bulk of fish introduced to South Africa have come from cold unsuitable climates. This is equally the case whether we consider the hatcheries, at Jonker's Hoek, at the Perie Forest, near King William's Town, or in Natal; or the fish introduced from time to time by private enterprise. Some of these have gone to the Transvaal. In matters of climate, it seems so hard to keep to the sane, sober middle-course—our own climate. Men come from Northern Europe, or they have travelled in the tropics: and we are besieged with the productions of Northern Europe and of the tropics. But it is the extra-tropical productions of Southern Europe, of California, of Australia, etc., that strike root, and add to the wealth

of South Africa. European Salmon are an instance of this. Surely they are a forlorn hope in South Africa. European Salmon are unknown in the Mediterranean, rare even in the South of England, but abundant in Scandinavia and Greenland. The text books tell us that Salmon does not occur in Europe further south than latitude 43° , and is not abundant below latitude 55° . The only argument I have heard adduced in favour of turning European Salmon into South African waters, was that Australia had wasted money on the attempt!

Trout are a more southern fish. There are good Trout in Italy, and Trout even in Algeria. The Italian lakes contain magnificent Trout, and their waters are well warmed in the long hot summer's day of Northern Italy. But the Trout imported into South Africa have not been obtained from Italy, mostly, indeed, from Scotland! The official account of one Italian Trout hatchery is given above. Doubtless there are others. There can surely be no real difficulty in getting Carp and Trout from Italy, or even the South of France or Spain.

There is no more reason to suppose that we have the best fish in our vleys, dams, and rivers, than that we have the best trees in our forests. On the contrary, in the case of a small isolated climatic habitat like that of the extra-tropical region of South Africa, there is generally ample room for the introduction of stronger and more useful forms of life culled from the larger floras and faunas of the great land areas in the Northern Hemisphere. As yet we can hardly be said to have taken the first step in the introduction of climatically suited fish. Of such climatically suited fish, the following may be cited:—

Murray Cod—*Grystes macquariensis*. Australians have a good deal to say about this fish: its sporting qualities, its hardness against heat and brackishness. It is a voracious feeder, and attains a large size (up to 100 lbs., H. Lawson), but it is the smaller fish of 5 lb. or 6 lbs. that have earned its reputation as a table fish. Fish up to 60 lbs. are caught, but these are coarse and oily. Like the Carp, it is a fish of sluggish waters. A few years ago some enterprising or ignorant persons attempted to introduce it to British waters. There, naturally enough, it failed. Murray Cod are found in the Murray, Goulburn, Murrumbidgee, and other rivers of Australia.

In the New South Wales *Agricultural Gazette* of January 3rd, 1905, the following three Australian fish are mentioned by the Government Fisheries' Expert as suitable for stocking ponds and water holes in New South Wales:—

Percalates colonorum or Common Perch.

Ctenolutes ambiguus or Yellow-belly.

Macquaria australasica or Macquarie's Perch.

These fish are described as excellent for the table, attaining a considerable size and herbivorous.

Salmo quinnat. Californian Salmon.—It is this fish that furnishes the bulk of that curious article of food which is neither fish, flesh nor fowl, and which is known throughout the length and breadth of South Africa as “tinned salmon”. Putting that doubtful product aside, the fish is one that is well worth having in South African rivers and one that is climatically suited to South Africa. Though most abundant in northern latitudes it is, or was, plentiful, as far south as the Sacramento River in California, and its southern feeder the San Joaquin, which extends as far south as latitude 35° , where temperatures would resemble those of the Cape Peninsula. According to S. Baird, temperatures rise as high as 84° in the waters of the San Joaquin in summer. According to M. Ravaret-Wattel, an authority on acclimatisation, the Salmon is found as far south as lat. 30° . This would make it suitable climatically to nearly all the rivers of Cape Colony. It is true that it has failed in the Rhone and other Mediterranean rivers. According to a recent writer in the *Bulletin de la Société Nationale d'Acclimatation*, the great efforts made to acclimatize this fish 20 years ago in the South of France were abandoned prematurely, and should be resumed.

It is said that *Salmo quinnat* will not rise to the fly and that as an eating fish it is inferior to the European Salmon. There is, however, pretty strong evidence that as an eating fish it is excellent, and quite as good as the European Salmon, according to the taste of many. Juillerat who has had the fish under cultivation in the Trocadero aquarium for the last twenty years, says that the fish, as long as it is kept in fresh water, has white meat of good flavour, like the Tunny fish, but somewhat richer and finer. It gets its salmon-coloured meat after having been in the sea. Whether it will rise well to the fly seems doubtful. Observers say that it eats nothing during its sojourn in fresh water. All the fish they catch have empty stomachs. It comes up from the Pacific in enormous numbers, spawns and dies. Everyone has read the accounts of the millions of this fish that swarm up the rivers, and of the quantities that are caught and tinned. The Government of the United States has established hatcheries to meet this consumption.

In the hatcheries *Salmo quinnat* is hardier and grows more quickly than the common Salmon. Juillerat says it is the easiest of all the *Salmonidae* to raise artificially. They live on almost any animal food. Their breeding time is a period of fierce excitement in which the males fight and savagely bite, not only one another but also the female fish. After spawning all the fish, male and female, without exception, sicken and die. The eggs are about the size of peas. They hatch in 35 to 45 days. Each female fish produces 1300 or 1400 eggs. There is little sickness and the proportion of death amongst the fry is unusually small.

We see thus that these salmon are easily raised, and suited climatically to Cape Colony. It does not follow because they have failed in the Mediterranean, an inland sea, that they should fail in an Ocean similar to that to which they are accustomed in California.

Salmo quinnat is stated to be identical with the Japanese Salmon, *Salmo japonnensis*.

Salar macrostigma. The Kabyl trout. This excellent fish is found in the clear mountain streams of picturesque Kabylia, the home of those fine trees the Kabyl Ash and the Silver Fir (*Abies numidica*). This Algerian trout is of stouter build than the European trout and distinguished by large black spots. It is possibly only a variety of the common trout *Salmo fario*. The Kabyl trout is an excellent sporting fish and abundant in spite of the Arabs who poach it in every conceivable way particularly by poisoning and diverting the streams of water.

I hope some day to see these fish in the Cedarberg streams, that wild country 100 miles north of Cape Town which in its crystal streams and picturesque ruggedness so much resembles the beautiful Kabylia of North Africa.

ARSENATE OF LEAD.

For Codling Moth and other Insects.

Where well made Arsenate of Lead can be readily obtained at reasonable cost, it should be taken in preference to Paris green and all other arsenical poisons for use against the Codling Moth and other plant insects. Excellent arsenate of lead can at last be bought in the Colony at a fair price, and the purpose of these notes is to encourage the adoption of the poison by making clear its advantages over other arsenical preparations that may be used for application to plants and trees.

Arsenate of lead first came into use as an insecticide about twelve years ago. The Gypsy Moth Committee of the Massachusetts Board of Agriculture for several years had been experimenting with nearly all the numerous poisons known to its chemical and entomological experts, in the work against the Gypsy Moth caterpillar, and arsenate of lead was the only one that proved more satisfactory than Paris green. The Committee thereupon adopted it as its spray poison and suggested its use against other insects. For several years no ready-made arsenate of lead appeared on sale, and all that was used was prepared in the spray tanks by mixing the ingredients in proper proportions. Gradually public confidence in the preparation became established, manufacturers began to make and advertise it, and year by year the sales have increased.

A small lot of the prepared poison was imported by Messrs. James Robertson & Co., Plein Street, Cape Town, at the writer's suggestion six years ago. The price at which it had to be sold, however, precluded its ready sale as long as Paris green was giving fair satisfaction; and it seemed inadvisable to push the sale because there seemed reason to fear that the article would deteriorate with age. It was in paste form; and it had been learned by experience that Paris green in paste form became more and more injurious to foliage when it was kept, and naturally it was feared that arsenate of lead might behave similarly. The deterioration was due to the formation of soluble arsenic. But after being kept for about five years, a jar of the paste arsenate was submitted to the Government Analyst who on analysis failed to find any soluble arsenic; and trees that were sprayed with a very strong mixture were not injured in the least. Then it was found that the merchants would be able to sell the article at less than half the price they were charging if there was sufficient demand to justify the importation of a large quantity at a time. They were strongly urged to import a consignment large enough to secure low rates, and having followed the recommendation, they, that is Messrs. James Robertson & Co., are now taking orders at 9d. per pound. The consignment is all in ten pound packages, and hence at least ten pounds must be taken at a

time. As there is likely to be a "run" on the article, intending purchasers should not delay in booking their orders; it may prove difficult to import a second consignment in time for spraying against the Codling Moth this season.

ADVANTAGES OF ARSENATE OF LEAD.

Freshly made arsenate of lead, or a well made prepared article like the brand alluded to above, has several advantages over the best Paris green. (1) Even when used extremely strong, it does not scorch the foliage. (2) It is flocculent in character, not granular, and is very easily kept in suspension in water. (3) It dries on the sprayed surface far more uniformly than Paris green and adheres much more tenaciously. (4) It is white in colour and at the strengths in which it is usually employed it shews on the foliage. And it may also be mentioned that it is not necessary to use lime with it. The prepared mixture is easily mixed with water and contains nothing gritty to wear the pump or choke the nozzles.

The comparative harmlessness towards the foliage is due to the absence of soluble arsenic. Paris green generally contains at least two per cent. of this injurious substance, and often much more. The flocculency is due to the ingredients having been brought together under conditions which give this characteristic; it is lost to a large extent if the product is dried, and it is chiefly for this reason that the article should come from the manufacturers as a paste, and not as a powder. The flocculent particles dry much more uniformly over the sprayed surface than would granular particles, and they adhere surprisingly long. One of the entomologists of the Gypsy Moth Committee states in a published article that he observed caterpillars dying on sprayed trees eight weeks after spraying. That the preparation may still show strongly after eight or ten weeks has been observed at the Cape, and chemical analysis of fruit plucked after this time had elapsed showed that considerable arsenic was present. American writers report the use of mixtures containing one pound of the arsenate to five gallons of water on "the most delicate" foliage without apparent injury, and a peach tree sprayed by us with this great strength last year shewed no indication of injury.

HOME-MADE ARSENATE OF LEAD.

Arsenate of lead may be made on the farm as wanted for use from arsenate of soda and acetate or nitrate of lead. The two chemicals must be dissolved in separate vessels, considerably diluted, and then mixed in the large bulk of water. The milk-white precipitate that forms is arsenate of lead. Arsenate of soda is very destructive to plant foliage, and some will remain in the water unless enough acetate or nitrate is used to unite with all of it. Generally eleven ounces of the acetate answers for four ounces of arsenate of soda, but more or less may be required according to the

purity of the chemicals. When the right proportions are used and the solutions properly mixed, the home-made article is as good as the best manufactured; and last year, before it was determined that the paste keeps good indefinitely, Messrs. James Robertson & Co., imported a large quantity of the two ingredients, and offered them put up in the proper proportions as determined by chemical analysis. Some is still on hand and can be bought at about six-pence per pound. The drawbacks to using the home-made mixture are obvious: if not enough of the acetate goes into the spray tank through any loss by spilling or otherwise, damage to the foliage may follow; and the contents of the two packages must all be mixed at once unless proportionate parts are measured from them. Strong solutions of the two in the same quantities of water can be made, kept in glass or wood, and used part for part as wanted for diluting. Hot water answers better than cold water for making the solutions.

POWDERED ARSENATE OF LEAD.

Last year a few merchants, having been repeatedly asked for arsenate of lead by fruit growers, placed orders with English firms and received in response arsenate of lead in the form of powder. Samples of two makes of powder have been examined by the Government Analyst. One was a buff coloured powder containing about fifteen per cent. of arsenic, and the other a white one containing about twenty, and neither contained any in soluble form. Chemically both appeared as good as the paste arsenate now being imported; but physically they were inferior. The flocculency that characterizes the paste and renders it specially valuable for spraying compared with Paris green was lacking. The buff powder settles in water fully as rapidly as Paris green, and shewed on foliage sprayed with it for a few days only. The white powder was a superior article and appeared to be very finely ground; but most of it settled to the bottom in a minute or two while some remained in suspension and kept the water quite milky in appearance for more than a day, behaviour which might lead one to think the mixture well suspended in water when in reality most of it was at the bottom.

A paste arsenate of lead is offered by the Fletcher Albany Tick Dip Co. of Grahamstown. The Eastern Province Entomologist has experimented with this make and found it an excellent insecticide and safe for use on delicate foliage. But in water it behaves like the white powder described above, most of it settling quickly whilst the water above remains milky far longer than in the case of the paste imported into Cape Town or the home-made article. But the chief drawback to the Grahamstown article is its cost; it is to be hoped that the Dip Co., will now lower this so that fruit growers may get the article at the price they have to pay for the American one.

The brand now offered in Cape Town is "Swift's," and, as intimated, it is made in America. At least one other brand with a well established reputation for reliability is made in America, and so far as is known to the writer no South African firm has attempted to get an agency for it. There are probably some makes that should be avoided. Extensive damage is said to have resulted last year in Ohio orchards from the use of an article supplied by a certain New York manufacturer; presumably there was some carelessness in the manufacture.

ARSENITE OF LEAD, AND ARSENITE OF LIME.

Several preparations for spraying can be made from arsenite of soda, the chemical used for prickly pear destruction, for cattle dipping to kill ticks, as locust poison, and also as a weed killer for use on gravel paths, etc. If mixed in solution with acetate or nitrate of lead, a flocculent precipitate is formed which much resembles arsenate of lead. A few small lots of this arsenite of lead were made by us last year and rather strong mixtures sprayed on various plants. For a few days the plants seemed unharmed, but later the foliage wilted and fell from the more sensitive ones.

In Australia and in some parts of America, a great deal of spraying against the Codling Moth is said to be done with arsenite of soda, made from boiling white arsenic with washing soda, precipitated with lime. The ready-made arsenite of soda we find, answers quite as well and its use saves a great deal of trouble. It contains as much arsenic as the best Paris green. To prepare the spray mixture, it is only necessary to dissolve a quantity of the arsenite in hot water, add this to the bulk of water in the tank, and then to stir in milk of lime made from good unslaked lime, using at the rate of ten pounds of the lime to one of the arsenite, one pound of which is sufficient for 150 gallons of water. Such a mixture was used on part of Mr. H. O. Arton's apple orchard at Meerlust, Groot Drakenstein, two years ago and the effect on Codling Moth was quite as good as Paris green which was used at the same strength on another part of the orchard. Arsenite of soda costs the Government less than 3d. per pound landed in the Colony, and may be bought at retail in Cape Town at 6d. from one or more merchants; but the cost of the lime would bring the expense up to that of Paris green in most parts of the Colony. Only a small part of the lime is necessary for the chemical combination that takes place but, unless the mixture is boiled which is impracticable, scorching of the foliage is likely to result if a great excess is not present. Old lime is often good enough, but its use is risky and hence inadvisable. A properly made mixture of this poison is less apt to injure foliage than Paris green and it appears to stick better; but after studying the matter closely and making many small experiments, the writer thinks that fruit growers had better use Paris green in preference so long as they can easily get a

good quality of this poison at a fair price, and, of course, good paste arsenate of lead should be preferred to either. In parts where there is difficulty in getting Paris green or arsenate of lead but where arsenite of soda or white arsenic is easily obtained, the position is reversed. To make arsenite of soda from white arsenic, three parts of the latter may be mixed with one part of caustic soda in a little hot water; the two combine with heat making a solution. This is generally a simpler and better way than boiling the arsenic with four times its weight of washing soda as is often recommended.

STRENGTH OF ARSENATE OF LEAD TO USE.

Paris green is generally used about as strong as experience has taught that it can be applied with safety to the foliage, that is a pound to 150 to 200 gallons of water. Swift's paste arsenate of lead contains about twelve per cent. of arsenic, or between one-fourth and one-fifth the quantity found in good Paris green, so to apply the ordinary amount of arsenic in spraying, one would need to use a pound to about 40 gallons. Owing to its better physical properties, however, the entomologist of the Gypsy Moth Committee who had most to do with arsenate of lead considered as the result of his experience that three to four pounds would do the work of a pound of Paris green; and at this rate, one pound would do for 50 gallons of water. But as, unlike Paris green, arsenate of lead can be used at practically any strength with safety to the foliage, it is customary to apply it stronger, thereby to make more certain of poisoning the insects. For the first one or two sprayings against Codling Moth at least two pounds to 50 gallons are therefore recommended; but for the latest sprayings, when for obvious reasons the presence of arsenic and spray stains on the fruit is open to more objection, the strength should not be over one pound to fifty gallons.

The propriety of using arsenical poisons on fruit is sometimes questioned. The subject has been much discussed from time to time by experts well qualified to judge, and their opinion is that the danger of affecting the health of any person eating the fruit, even when very strong spray mixtures are used and the skin entirely consumed, is really too infinitesimal to be seriously considered. To be able to give an approximate idea of the risk, the writer last season had an apple tree on which the fruit was ripening, very heavily sprayed with a mixture of one pound of Swift's arsenate to 20 gallons of water, and on the next day had four of the fruits submitted to the Government Analyst for determination of the arsenic present on them. The tree had been sprayed once or twice before during the season, and care was taken to get samples that were well coated and to prevent the poison getting prematurely brushed off in any way, but the chemist found only 0.00075 grammes of arsenic, which was equivalent to about 23 parts to 1,000,000 of the fruit. To get

0.14 grammes, the dose of arsenic considered fatal, a person would have to consume about 746 such apples. Then in considering the risks, one should remember that it is not customary to spray within a few weeks of plucking, that the fruit always is submitted to more or less rubbing in one way or another, and generally wiped off and often peeled before it is consumed. None of the poison goes into the tissues of the fruit; were any to be absorbed, the fruit would be at once injured, for arsenic is a most virulent plant poison. Paris green, smeared on skin-broken peaches, has been observed to cause the death of nearby portions of the tree; presumably the plant juices which are brought in contact with the poison dissolve and absorb a small amount and carry it into the wood.

WHEN TO SPRAY.

A number of sprayings are required to protect fruit from the Codling Moth, for however well the spraying may be done and the poison adhere, the expansion of the fruit must gradually cause the exposure of more and more unpoisoned surface. It is of no use spraying before many of the blossoms have fallen and of comparatively little use spraying before the first blossoms to fall have been off a week. To spray unnecessarily early is worse than useless, for the welfare of the insects that visit the blossoms for nectar should be considered. There was considerable discussion in American entomological circles a dozen years ago as to the effect on bees of spraying fruit trees when in bloom, and one prominent expert succeeded in bringing forward rather conclusive evidence that many bees become poisoned and die. But under our Cape conditions it is generally necessary to spray before all the blossoms are off, notwithstanding the liability of poisoning some bees. A second application should be made a week to ten days later to put poison on the fruits that have formed after the first spraying. A third spraying two or three weeks later, if with arsenate of lead, should leave the fruit well poisoned for the first brood of the pest. At least one more spraying for the main crop of apples appears advisable at the Cape, and this should be time to catch the second brood, say about the middle of January; if very much of the pest is about, two late sprayings, one about the 10th of January and the other about three weeks later, may be advisable. Some growers prefer to spray much more often, but the writer doubts the necessity of such procedure if the spraying is properly done. It is better to trust to two really thorough sprayings than half a dozen carelessly applied ones. Spray work should have very thorough supervision, much more than is usually given to it, both at the pump and at the nozzles. Too often the pressure is too low for good work, the spray too coarse, and a good number of the fruits on a tree sprayed on one side only if at all touched.

C.P.L.

INTER-COLONIAL AGRICULTURAL UNION.

Continued from page 115.

SECOND DAY, THURSDAY, MAY 31ST.

PROTECTION *v.* FREE TRADE.

On resuming at 9 a.m. a long discussion ensued on the question of Protection in which Messrs. Douglass, Van de Merwe, Malan, Van der Byl, Hards, Scott, Le Sueur, Lee and others took part.

Mr. Van der Merwe (Transvaal), moved: "That this Union affirm the principle of re-adjustment of import dues by the Customs Convention in such a way that those articles of produce grown in sufficient quantities in this country shall be heavier taxed, and that taxes on produce not grown here shall at the same time be imposed so as not to increase the cost of living while at the same time promoting agriculture and stock-breeding."

Mr. Malan (Transvaal) seconded.

Mr. Lee said it ought to be their object to make the cost of living in this country as cheap as possible. At the same time, he thought they should defend themselves against unfair foreign competition. He therefore moved the following amendment: "That this Conference declares itself in favour of the principle of protection, but feels that it should be judiciously applied with the greatest care and circumspection to the necessities of life, and in any case only to those necessities to which the granting of State bonuses is found to be impracticable. Further, that the various Governments of South Africa take into consideration the advisability of regulating the price of necessities of life.

This was seconded by Mr. Van der Byl.

Mr. Nicholson said the Free Trader in England had seriously affected the agricultural industry in that country, and whilst in principle and to a great extent he believed in Free-trade, he thought the time had come when farmers throughout the whole of South Africa should at least call themselves defenders of their own rights if they did not call themselves Protectionists. He did not believe in prohibitive duties which would increase the cost of living, but

he certainly favoured moderate taxation which would not increase the cost of living. He thought the Congress should give all the Governments of South Africa to understand that the agriculturists had to live, and that the only means of livelihood was to make a profit out of what they produced.

Mr. Ryan moved: "That the Congress re-affirm the resolution carried last year namely: "That this Congress affirm the principle of protection on all articles which can and ought to be produced in South Africa in sufficient quantities to meet the demand."

Mr. Hancock in seconding said he believed that protection was necessary for the South African farmer. In England the agriculturists were the chief sufferers by Free-trade, and he would be sorry if this country adopted that principle.

On going to the vote Mr. Ryan's motion was carried and on the proposition of Mr. Nicholson it was decided to telegraph it to the Inter-Colonial Council sitting at Bloemfontein.

INSPECTION OF EXPORTED PRODUCE.

On the subject of the necessity for an official inspection of exported grain some discussion ensued when it was finally resolved, on the motion of the Rev. Mr. Scott, seconded by Mr. J. Daverin:—"That this Congress is of opinion that officials should be appointed at all South African ports of entry to examine all such products sold for export as may be considered advisable by the standing committee and to supply a certificate stating the quality of each consignment."

INSECT PESTS

Mr. Nicholson moved: "That Congress urge upon the respective States the necessity for preventing the spread of insect pests, and their eventual eradication."

Mr. Malleeson dwelt on the necessity for the various Governments taking combined action, which he hoped would eventually develop into compulsory measures.

Mr. Van der Merwe said he thought that all Governments should take action in the matter. In the Transvaal the Government was always conducting experiments. He thought the resolution should be brought forward session after session, so that the members could see what was being done.

Mr. Douglass did not think it would be possible to compel farmers to clean their orchards, but they would soon find out that if they did not do so they would soon have no orchards left.

Mr. Simpson referred to the active measures being taken in Transvaal to prevent the introduction of insect pests and as a result there was very little disease, and little necessity to enforce compulsory measures.

Mr. Evans thought that if compulsion were enforced, then the matter would be a failure.

Mr. Lounsbury said it was difficult to get a farmer to spray until the necessity was brought home to him in a forcible manner, namely, the loss of his crop. It was absolutely impossible to exterminate insect pests, but they could be controlled.

Mr. Malleson moved, as an amendment: "That Congress affirms the principle of combined effort in destruction of insect pests and deprecates any precipitate action in form of compulsory legislation."

The amendment was lost, and the motion carried.

INTER-COLONIAL STOCK REMOVAL REGULATIONS.

Mr. Robertson moved, seconded by Mr. Malan: "That combined Inter-Colonial regulations be framed by the various Governments for the removal of stock from one Colony to another, providing for inspection by responsible veterinary officers, the certificates issued by these officers to be recognised for Inter-Colonial purposes."

Mr. Nicholson said what was desired was the inspection of cattle, but it was not fair to have to send from the border of a Colony to Bloemfontein or Pretoria for the veterinary officers.

The resolution was carried unanimously.

CENTRAL OFFICES.

Mr. Van der Merwe moved that the secretarial offices of the Union be fixed in one place, as central as possible.

The President said the principle was good, if the money was forthcoming. If Rhodesia and Orange River Colony had joined the Union, the income would be about £125 per annum; at present, it was £75. He did not think that the salary of a secretary and office and printing expenses could be met by £75, and the Natal section could not give more than 25 guineas per annum.

Congress proceeded to next business.

RAILWAY RATES ON EXHIBITS FOR SHOWS.

Mr. Robertson introduced the subject of asking the railways to carry exhibits to shows free. They all knew, he said, the great educative principles of shows. He thought it would pay the railways to carry exhibits free. He mentioned as an instance of his contention that if exhibits were carried free, it would tend to increase their receipts. This system was carried on to very good effect in Natal some years ago. He, of course, thought the number of exhibits should be limited, and if they were sold, that the exhibitors should pay the full railway rates.

The President said that one reason for the withdrawal of the privilege in Natal was revenue purposes, and the other that one man sent 60 head of cattle down to the Durban Show, some of which was not show stock. He thought that all cattle which took prizes or certificates should be carried free.

After further discussion the following resolution, moved by Mr. Lee and seconded by Mr. Scott, was carried: "That this Union is of opinion that all exhibits for Agricultural Shows be carried on the South African Railways at the Cape rates, and that the rates charged for visitors to Shows be fixed on the same basis."

Congress then adjourned for luncheon.

AFTERNOON SITTING.

Immediately after luncheon the delegates visited Mr. Mellish's stud at Vrede Hoek and resumed business in the City Hall about 4 p.m.

OSTEO-POROSIS OR BONE DISEASE IN HORSES.

The subject of Osteo-Porosis or Bone Disease in Horses was the first for discussion. Copies of the illustrated pamphlet on the subject issued by the Department of Agriculture (Cape) were laid on the table.

Mr. Hutcheon, Director of Agriculture (Cape) gave an account of the investigations carried out in trying to trace the cause of this disease and admitted it was still obscure. Further investigations are, however, proceeding and hopes are entertained of more satisfactory conclusions in the future.

Mr. Scott moved, seconded by Mr. Moon, that the resolution passed at last Conference be re-affirmed, namely "This Conference requests that the Governments of those Colonies in which the disease known as Osteo Porosis exists be asked, in the interests of Horse-breeding in South Africa, to make further investigations into the disease, with a view to its prevention or eradication."

THE ERADICATION OF TICKS.

Mr. Scott moved the resolution on the paper on the above subject viz., "That the Inter-Colonial Union desires to urge upon the different Governments the necessity for further and continuous efforts in the direction of the eradication of ticks."

Mr. Malan seconded.

The Director of Agriculture (Mr. Hutcheon) gave a detailed account of the steps taken in Cape Colony to eradicate the tick, and said that up to the present the best dip known was an arsenical compound. There was, however, one drawback to this dip, and that was the fact that it was found better not to work cattle immediately after being dipped.

Mr. Malan said they were all very thankful to Dr. Hutcheon for his interesting statement. He would, however, like to know if it would not be possible to eradicate ticks by resting the land on which they were found to exist.

Mr. Hutcheon replied that some time ago an experiment in this direction was tried, but unfortunately the terrible drought came along, and the result was that the piece of veld being rested was the only piece on which there was any feeding, and the cattle had to return to it.

In reply to Mr. Scott, Mr. Hutcheon said that undoubtedly paraffine was the best thing for spraying, but he believed in dipping.

Mr. Douglass said he had been spraying his cattle for many years, and he could claim he had practically a clean farm. A great drawback, but one he had to face, however, was that he could not sell his cattle in Grahamstown, because it was known that his cattle were so clean that if put on tick-infected land they would most likely contract the tick-transmitted disease. However, he had a good market to the North. He disagreed with Mr. Hutcheon if he said that land could be cleaned if it was not used. He could give several instances of land bounded by rivers on which there had never been cattle, being infested. If there were ticks on the land higher up, and the river washed over his land, plenty of ticks were to be found.

Mr. Simpson said he had never noticed what Mr. Douglass complained of, but he believed that if there was an overflow of water, that it was possible ticks could be conveyed to clean land.

Mr. Lounsbury said he had made experiments with ticks, and he found that they did live in water. Ticks were to be found in great numbers on wild animals and birds.

Colonel Cuning said Mr. Hutcheon had mentioned that cattle after being dipped could not be used for some time. He would like to know what time had to elapse because in East London they were very much interested in transport riding.

Mr. Hutcheon said a great deal depended on the state of the weather. If the weather was cool and the cattle had been dipped, they could be moved in the afternoon, but it was best to give them a day's rest. He believed that on the elimination of ticks depended the elimination of disease.

The President inquired if Mr. Lounsbury in his experiments had used either Izal or Cylline for the destruction of ticks.

Mr. Lounsbury said he did not remember having done so.

The President said in Natal they had been hunting the tick for the past ten years. They began with the spray with paraffine emulsion, but gave it up after a year. Four years ago they started the dip, and found it most satisfactory. They dipped twice a month at the rate of 2,000 head of stock a month. He found that animals that had been dipped several times stood it far better than

those first dipped. The time for resting animals after being dipped varied very much, according to the weather. In cool weather they could inspan the animals immediately after dipping, but in warm weather they often had to dip them and let them rest four or five days, especially if they had a long trek before them. To encourage the drivers not to work the animals too much, they exonerated them from blame if they outspanned their animals. He thought the Governments should spend more money in eradicating ticks. With regard to Red-water, they found it was not diminishing. They found that if they took their calves away from the cows and kept them locked up for some months, they developed Red-water, but if they were allowed out a couple of hours a day they came in contact with the tick, and soon got all right. With reference to horses, they dipped them once a week, and they never looked better.

Mr. Douglass : You have not made it clear as to whether you are reducing your ticks.

The President : We have about 25 per cent. left.

Mr. Lee : Do you hope eventually to eradicate them ?

The President : I am not so optimistic. In Cape Colony, where you have so few trees and bush and kloof, you may succeed, but in Natal I fear we will not.

Mr. Lounsbury inquired of the Chairman what kind of paraffine emulsion he used.

The President replied that they used soap emulsion.

Mr. Lounsbury : We have not found it nearly so effective as mechanical emulsion.

In reply to a delegate, the President said he did not believe cattle would stand dipping more often than once a fortnight. It was found that dipping caused the supply of milk to deteriorate for a few days, consequently they went in for the monthly dipping.

Mr. Lounsbury mentioned that in experimenting they sprayed two cattle very heavily once a week for fifteen weeks, and it had no bad effect.

The resolution was carried unanimously.

EAST AFRICAN COAST FEVER.

The next subject discussed was East African coast fever, the following resolution being forwarded from Natal for the consideration of the Congress : "That the attention of the various Governments be drawn to the necessity of preventing the spread of East African coast fever, especially in regard to the recent outbreaks in connection with the military operations in Natal."

The President mentioned that in Natal the Veterinary Department had made a big fight against this disease, and had succeeded in cleaning certain parts of Zululand. Unfortunately, just at that time the war broke out, and the military captured a lot of cattle and drove them hither and thither through infected land.

If these cattle were allowed to return to Natal, they would spread the disease. Therefore, he thought that the Government should be requested to confine these cattle in Zululand until they were certified clear of disease. Otherwise they would find that the whole of South Africa might become infected.

Mr. Scott supported what the president had said, and moved the resolution as above stated.

Mr. Malan seconded, and suggested that the executive write to the Government asking them to take urgent measures in the matter.

The resolution was carried unanimously and Congress adjourned till the evening.

EVENING SITTING.

STANDARDISING IMPLEMENTS AND MACHINERY.

A resolution tabled by the Transvaal: "That it is advisable in the interests of the general agricultural community, that an attempt be made to standardise farm implements and machinery," was ordered to stand over till next session.

FUTURE CONGRESSES.

On the question of fixing a date for future Congresses arising, it was decided to amend rule 24 as under: "The date of the next succeeding Annual Conference of the Inter-Colonial Agricultural Union shall be fixed at each Annual Conference. These meetings shall be commenced as early as possible in the week, and shall be held as far as possible in different Colonial centres."

SCHEME OF VOTING.

Rule 9 was also altered to read as follows:—"The Annual Inter-Colonial Conference shall consist of not more than ten delegated voting members of each affiliated Union who shall elect or re-elect from their number a President, one or more Vice-Presidents, and the officials hereinafter provided for at the Annual Conference hereinafter described. These elections shall be by ballot of the members present and voting shall be equalised as to Colonies and not as to the number of affiliated societies."

ELEMENTARY AGRICULTURE IN SCHOOLS.

On the motion of the Transvaal it was unanimously agreed: "That the attention of the various Educational Departments be called to the necessity of teaching the rudiments of agricultural practice in country elementary schools."

LOCUSTS.

Mr. Simpson, the Transvaal Government Entomologist, gave a very interesting address on locusts, illustrated with lantern slides. In the course of his address, he explained in detail the methods adopted in locating and destroying the locust swarms and mentioned that although, the Transvaal and Natal were both taking active steps to eradicate the locust, Cape Colony and the O.R.C. did nothing, with the result that the locusts were bred in the colonies mentioned, and, when developed, crossed into the Transvaal. Legislation to prevent this should be introduced. ¶ ¶ ¶

It was eventually agreed: "That this Conference considers it necessary that united action should be taken by the South African Colonies in respect to the destruction of locusts; and further, that it be an instruction to the Standing Committee to take continuous and persistent action to induce the Cape and O.R.C. Governments to join the Transvaal and Natal in the destruction of locusts."

INTER-COLONIAL JUDGING.

Mr. Van der Merwe moved, Mr. Scott seconded, and it was carried unanimously: "That a scheme be formulated whereby each Agricultural Union shall compile lists of qualified Judges, whose services would be available for Inter-Colonial purposes, and that each State be requested to grant free railway passes for Judges travelling to and from Agricultural Shows."

STUD ANIMALS.

The advisability of Government qualifications of Stud Animals used in the Colony was next discussed.

Mr. Robertson moved: "That this Conference desires to urge upon the various Governments of the South African Colonies the necessity of taking steps to prevent the injury done to stock and sheep farmers by the presence of unsuitable sires running at large."

The resolution was adopted.

THE STUD BOOK.

Mr. Lee moved a resolution urging on the various Governments the necessity of securing from unauthorised use the South African Stud Book's recognised work, and also its common seal.

Carried unanimously.

AGRICULTURAL JOURNAL.

The question of an Inter-Colonial Agricultural Journal was raised on the receipt of a communication from a paper in Bloemfontein, which asked for the privilege of being the official organ of the Union.

It was decided that should the Executive Committee of this Union deem it advisable, they shall take steps to secure the service of some private paper which shall publish all its official reports and notices in both English and Dutch.

SPRAYING AND DIPPING MATERIALS.

Mr. Malleson moved, seconded by Mr. Malan, and carried: "That this Congress is of opinion that materials used for spraying and dipping stock and plants or any materials used for the destruction of insect pests should be imported free of duty, the purchaser to be required to make a declaration before a Justice of the Peace that the said article is to be used for spraying only, before he can obtain the concession.

THE NEXT CONGRESS.

Mr. Nicholson moved, seconded by Mr. Malan, that the next Congress be held at Pretoria. Carried.

Mr. Nicholson then moved, seconded by Mr. Robertson, that the next Congress be held in the third week in August the actual date to be fixed by the Executive. Carried.

The President, on behalf of the visiting members, moved a hearty vote of thanks to the Governor, the Mayor, and the Civil Service Club for the manner in which they had received and entertained the delegates.

Mr. C. G. Lee was elected President for the coming year and the following as Vice-Presidents: Transvaal: Mr. Van der Merwe, Mr. Malan and Mr. Nicholson; Natal: Mr. Scott and Mr. Alexander; Cape Colony: Mr. Lee and Mr. Rawbone.

Executive Committee: Cape Colony: Messrs. Evans, Malleson, and W. van der Byl; Natal: Messrs. Mitchell, Craig, and Hancock; Transvaal: Messrs. T. Smuts, P. Van de Venter, and A. J. Robertson.

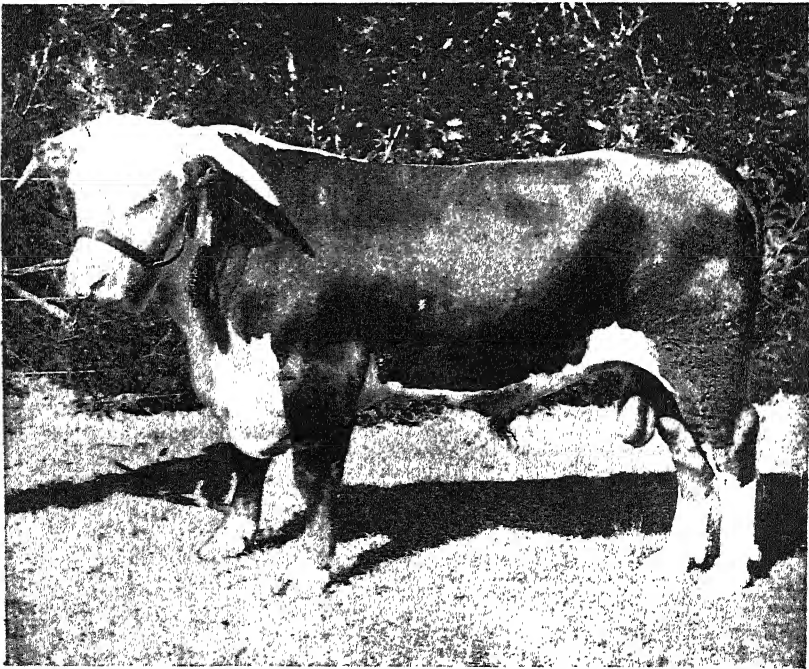
Secretary and Treasurer: Mr. MacDermott (Editor *Cape Agricultural Journal*).

A vote of thanks was accorded to Mr. MacDermott for acting as Secretary during the Congress, and to Mr. Eadie for his services in a similar capacity last year.

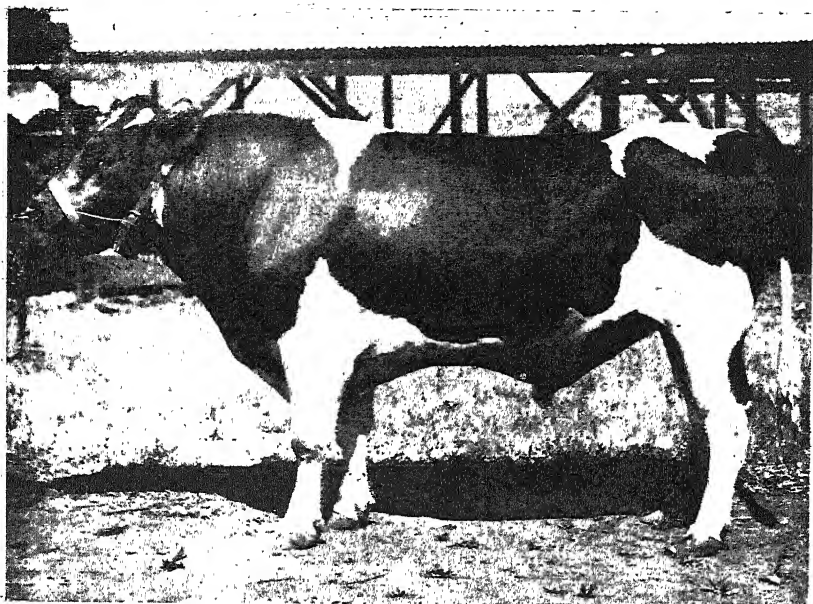
This concluded the business portion of the Congress. The delegates and several members of the Cape Colony Agricultural Union proceeded by special train the next day to Darling to inspect the creamery and some local farms in the district and on the following day made the round trip in motor cars to Hout Bay, Constantia, Tokai and back to town.

PRIZE CATTLE AT THE KOKSTAD AGRICULTURAL SHOW.

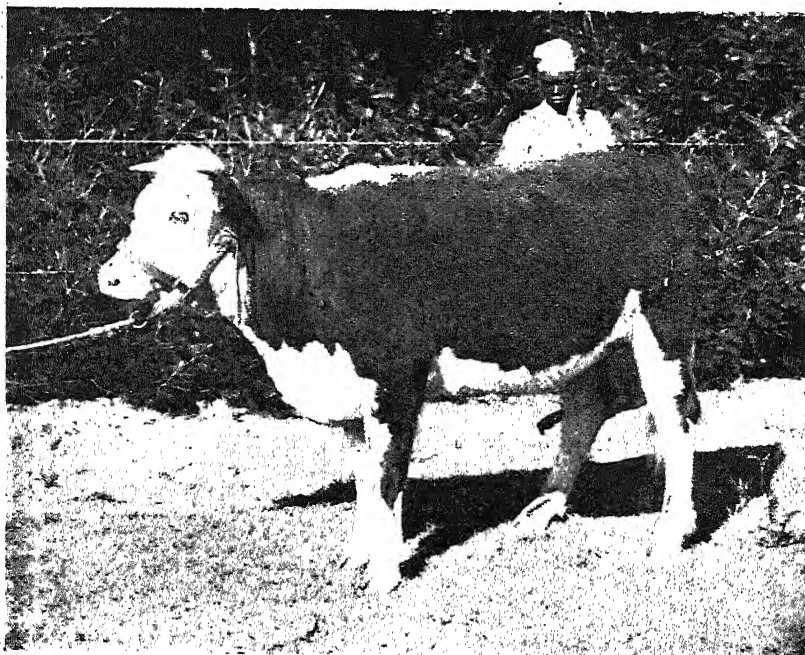
By the courtesy of Mr. Rowland Webster, Secretary of the East Griqualand Agricultural Society we have been supplied with photographs taken by the Monochrome Photo Co., of Kokstad, of some of the prize-winning stock at the last Show held by that Society, as well as other views. Herewith we reproduce three of the more interesting. The first is the Champion bull of the yard, a Hereford, named "Baronet", imported and owned by Mr. C. R. Rennie. The second is the first prize Friesland bull, "Gracia Ward Piebe ", imported and owned by Mr. P. E. Leonard. The other is a Hereford heifer, yearling, bred and owned by Mr. C. R. Rennie. Such fine stock is a magnificent sample of what our farmer friends are doing in the far East.



Hereford Bull "Baronet," First and Champion at the late Kokstad Show.
Imported and owned by Mr. C. R. Rennie.



First Prize Friesland Bull "Gracia Ward Piebe," at Kokstad Show.
Imported and owned by Mr. P. E. Leonard.



Hereford Heifer owned and bred by Mr. C. R. Rennie.

EXPERIMENTAL CROPS IN CAPE COLONY:—GRASSES.

A PROGRESS REPORT.

By DR. ERIC A. NOBBS, Agricultural Assistant.

From all quarters, and continually, enquiries are made of the Agricultural Department, as to whether there are no grasses suitable to be grown in this Colony, either for hay or grazing in camps or for scattering on the open veld in order to restore it after many years over-stocking, or to provide feeding for stock at times when natural herbage is scarce, summer or winter, as the case may be. Occasionally the request is for something quite unobtainable: a quick-growing, nutritious, succulent grass, perennial, which will grow without water during the dead season, and give heavy crops, on barren soil preferably, without preparatory or subsequent tillage or cultivation of any kind. Desirable as such a crop would, no doubt, be, this is not the goal towards which the co-operative experiments now under report are aimed. It is preferable to restrain our ideas within the region of possibilities.

One of the chief practical difficulties in farming in Cape Colony is the striking difference between the stock-carrying capacity of certain regions at different seasons, whereby farmers at one time see their land covered with grass or bush which they cannot keep down, while later on the stock fall off in condition for lack of food. To restore an animal to good condition requires much more than to maintain it in fair health. Products such as milk fluctuate in price enormously at different seasons, so that there is every inducement to produce it out of season, even at an enhanced cost of production. These and kindred reasons are sufficient to render it very desirable not only to improve our pastures, but by every means possible to extend the season of their active growth. This is to be done by judicious paddocking, resting the veld, water leading, and in some cases by draining, but, perhaps, most of all by increasing the varieties of the grasses particularly by introducing those which grow at a season somewhat different to that of our own indigenous grasses and shrubs.

The European grasses, while very nutritious and palatable, are somewhat delicate, but in spite of this drawback, certain of them,

notably the rye grasses and cocksfoot, give evidence of proving generally useful, not only in moist situations, in vleis and under irrigation, but even on the open veld in regions blessed with a good rainfall, if reasonably protected from over-grazing.

One of the bromes has long been familiar to the Cape farmer as winter grass, tuin gras, or van der Merwe's gras, common about orchards and along sluits, but seldom made use of as its merits deserve. That this is one of the best grasses of both the United States and Australia, does not seem to be generally known, nor has sufficient advantage been taken of the fact that this is essentially a winter grass, growing when nothing else will, and giving place in summer to other things on the same area.

To Australia we owe a debt for the discovery of *Paspalum dilatatum*, which bids fair soon to become one of our best and most popular fodder plants.

Rhodes grass is also receiving attention, but on account of the difficulty in procuring seed, less than might be desired.

COCKSFOOT GRASS.

The trial of this European Grass has brought out an interesting series of reports. It has proved itself a valuable grazing grass on moist situations. Tender herbage such as it produces is obviously unable to stand severe drought, but where the conditions are favourable, or some care has been exercised, this grass has given gratifying results sufficient to recommend it for further and wider trial.

Drought and weeds are the two dangers to be apprehended, but where these can be overcome there seems no reason to prevent the extended cultivation of Cocksfoot. The following are the reports:—

Tulbagh (Mr. G. J. Evrard). Sown 15th July. Result: Good. Seed came up well; very good for sheep; suitable and will pay in district I think.

Worcester (Mr. P. R. Rabie). Sown early in June. No remarks.

Worcester (Mr. A. J. van der Merwe). Sown July, 1905. Result: Fair. Should be sown in April for winter rain, or otherwise must be irrigated.

Wellington (Mr. J. H. Buxman). Sown July 13th, 1905. Result: Indifferent. Seed came up, but did not make much growth. I consider this grass unsuitable for this part.

Stellenbosch (Mr. O. M. Barry). Sown 10th August, 1905. Result: Good. The best of the English grasses. Grows all the year round on vlei ground, but must be irrigated on hill sides.

Stellenbosch (Principal, Elsenburg). Sown 14th July, 1905. Result: Fair. Has stood through the year fairly well.

Paarl (Mr. J. A. Low). Sown 24th June, 1905. Result: Good. A good grass, but requires irrigation.

Clanwilliam (Mr. W. McGregor). Sown early in August. Result: Good. With irrigation this crop should prove excellent for grazing purposes. Will graze mine in January.

Cape (Mr. P. van der Byl). Sown middle of May. Result: Indifferent. Grazed by cattle in January, but I do not consider grass suitable.

Knysna (Mr. Geo. Parkes). Sown 18th May, 1905. Result: Fair. Grass seems to be doing well, but it is difficult to judge from so small a piece.

Alexandria (Mr. J. Daverin). Sown 4th July, 1905. Result: Indifferent. Died off when dry weather set in.

Albany (Mr. A. W. Munro). Sown October, Result: Bad. Came up well, but when rain ceased died away long before our natural grasses. In my opinion, quite unsuitable to withstand drought.

Fort Beaufort (Mr. A. Barker). Sown August or September, 1905. Result: Good. I consider grass suitable, and will pay in this part; if possible sow in Autumn to escape weeds.

East Griqualand (Mr. A. W. Sephton). Sown 10th September, 1905. Result: Very good. If sown extensively will revolutionize stock raising in this country, giving good green feeding during early spring; splendid grass.

East Griqualand (Mr. W. C. Potts). Sown November, 1905. Result: Good. It resists drought fairly well, and stock are fond of it. It is suitable and will pay in this part.

East Griqualand (Mr. W. E. Pitout). Result: Good. Will pay, and is the best grass for this part; grows wonderfully well.

PERENNIAL RYE GRASS.

This, one of the standard European grasses, has given results, good, bad, and indifferent, but seems to furnish reasonable hope that on further trial it will prove suitable to certain parts of the Colony.

The following are the reports:—

East Griqualand (Mr. W. C. Potts). Sown September. Result: Good. Appears to stand drought fairly well.

East Griqualand (Mr. A. W. Sephton). Sown 12th September. Result: Good. Will grow luxuriantly here; is stooling well. No disease.

East London (Mr. E. Genis). Sown 12th July. Do not consider suitable; withered away during dry weather, but seems to be getting green again.

Victoria East (Mr. Lex. Smith). Sown August, 1905. Failed to germinate; am sowing again in March.

Knysna (Mr. C. W. Thesen). Sown 5th May, 1905. Result: Bad. Started well, but destroyed by rust.

Sown 20th May, 1905. Result: Fair.

(Later)—Grew to about 12 inches high, and covered ground well, but died off in January.

Knysna (Mr. G. van Huyssteen). Sown 29th June, 1905. Died when 3 inches high; may have been due to heavy rain.

Knysna (Messrs. Geo. Parkes & Sons). Sown 18th May, 1905. Result: Good. Looks very promising.

Alexandria (Mr. John Daverin). Sown 4th July, 1905. Result: Indifferent. Started well, but dried up when dry weather set in.

Ceres (Superintendent, Kluitjes Kraal). Sown 20th September, 1905. No remarks.

Worcester (Mr. P. R. Rabie). Sown early in June, 1905. No remarks.

Worcester (Mr. A. H. du Toit, R. Son). Sown early in August. Result: Indifferent. Made very little growth: lucerne sown at same time already given two crops.

Tulbagh (Mr. G. J. Evrard). Sown 15th July, 1905. Result: Good. Very good for sheep in paddocks.

Paarl (Mr. J. A. Low). Sown 1st July. Result: Good. Good for cattle, but should be sown in April or May.

Wellington (Mr. J. H. Buxman). Sown 13th July. Result: Fair. Did not come to seed; very dry. Will give it another trial.

Stellenbosch (Mr. A. Kennedy). Sown 6th July, 1905. Result: Indifferent. Has died of drought; may grow again when winter rain sets in.

Caledon (Mr. H. Veal). Sown 15th September, 1905. Result: Indifferent. Seed germinated, but died with cession.

Cape (Mr. A. E. Gower, c/o Superintendent, Tokai Plantation). Date not given. Seed failed entirely.

Cape (Mr. P. van der Byl). Sown early in July, 1905. Result: Indifferent. I don't think grass at all suitable for this part.

Piquetberg (Mr. E. Conz). Sown 23rd June, 1905. Result: Good. Will give good grazing if sown on old lands.

Clanwilliam (Mr. W. McGregor). Sown early in August. Result: Bad. Do not think grass suitable, as it has to be constantly irrigated.

Beaufort West (Messrs. B. J. Pienaar & Son). Sown August, 1905. Result: Indifferent. Grass came up well, but does not grow long enough for grazing.

Molteno (Mr. A. Francis). Sown 26th September, 1905. First lot cleared by locusts; remainder failed to germinate.

ITALIAN RYE GRASS.

This variety, while closely allied to the other, is, if allowed to flower and mature its seed, only of annual habit, and so far less suitable for many purposes than a permanent grass, yet it has, on the whole, thriven better than has the perennial form, and has given

some very promising results, indeed. Fourteen hundred pounds of hay from five pounds of seed, or at the rate of over three tons per acre, sounds very well, especially when it is remembered that rye-grass gives some of the finest quality of hay in the world on which the best race horses are fed. Our grain merchants and others would be well advised to stock the seed of such grasses, and push the sale, as, undoubtedly, it has a useful place to fill amongst the number of our crops.

The following are the reports:—

Cape (Mr. P. van der Byl). Sown early in July, Result: Good. 1,400 lbs. of hay from about one-fifth acre, 5 lbs. of seed sown.

Stellenbosch (Principal, Elsenburg). Sown 14th July, 1905. Result: Good. Came away best of all grasses, and if sown with first rains on a light soil, will pay well in year of sowing.

Stellenbosch (Mr. A. Nicholson). Sown 26th June. Result: Good. About the best of all the grasses tried, used for grazing.

Stellenbosch (Mr. A. Kennedy). Sown 6th July. Grew well during wet months, but died off when dry weather set in.

Malmesbury (Mr. J. V. Duckitt). Sown 10th August, 1905. Result: Good. At its best during the Spring, when there is plenty of natural grass.

Herman (Mr. J. A. Low). Sown 24th June, 1905. Result: Good. Must be sown in April or May. If sown later, grass requires irrigation.

Piquetberg (Mr. E. Conz). Sown 23rd June, 1905. Result: Good. If sown on damp ground, will give good grazing.

East London (Mr. E. Genis). Sown middle of July, 1905. Result: Fair. Grew well in patches on black and sandy soil about 1 foot high, but think it unsuitable for this part.

Komgha (Mr. M. Biggs). Sown end of August. Result: Good. Came on splendidly, but damaged by heavy rain. Am leaving patches to seed, and re-sow itself.

Queenstown (Mr. S. A. McConel). Sown September, 1905. Result: Good. Sown in small camp where grass can be flooded, about 18 inches to two feet high, growing well.

Colesberg (Mr. A. Robertson). Date not given. Result: Good. When irrigated it beats lucerne in winter, growing luxuriantly.

Molteno (Mr. A. Francis). Date not given. Destroyed by locusts, sowing again.

Knysna (Mr. C. W. Thesen). Sown 20th May, 1905. Result: Doubtful. Did better along edges of bed. Probably sown too hick.

Tulbagh (Mr. G. J. Evrard). Sown 15th July, 1905. Result: Good. Splendid grazing for stock, am sowing again.

Worcester (Mr. Philip R. Rabie). Sown early in June, 1905. Will give it another trial before passing an opinion.

Molteno (Mr. A. Francis). Sown 26th September. 2nd November, 28th December. First seed came up, but cleared by locusts. Remainder of seed failed to germinate.

Beaufort West (Messrs. B. J. Pienaar & Son). Sown in August, 1905. Has come up well, but fails to grow, keeping almost too short to graze.

East Griqualand (Mr. A. W. Sephton). Sown 10th September. Result: Good. Will thrive throughout this district, I think, and be of enormous value for stock breeders.

Middelburg (Mr. Alf. P. Kleugden). Sown 12th July, 1905. Result: Fair. Grew very well until water failed in October, then died off.

MEADOW GRASS.

It is only by experiment that we can ascertain whether a grass is to be generally recommended or not. In this instance, while sometimes doing well, and sometimes brought to nothing by accidents, yet the general impression left is not favourable. Drought seems to tell very quickly on such a surface feeder and where it grows, others, such as Cocksfoot and Timothy, seem to do better. The reports are not, however, without interest and are accordingly attached.

Tulbagh (Mr. J. J. Evrard). Sown 15th July, 1906. Result: Good. Good for sheep in paddock but grass made very little growth.

Paarl (Mr. J. A. Low). Sown 1st July. Result: Good. Good grazing for cattle, but should be sown in April or May so as to be able to do without irrigation.

Cape (Mr. G. van der Byl). Sown early in June. Result: Indifferent. Grazed by cattle in January. I do not think it suitable.

Caledon (Mr. H. Veale). Sown 15th September, 1905. Result: Indifferent. Did not germinate well, might do better if sown earlier.

Worcester (Mr. P. R. Rabie). Sown early in June. Seed started well, but was killed by drought.

Worcester (Mr. A. H. du Toit). Sown early in August. Result: Indifferent. Germinated well, but did not make much growth; lucerne is far better.

Knysna (Mr. C. W. Thesen). Sown 5th May. Result: Fair. Not making a very satisfactory growth 2/2/06. (April 16th, 1906, further report—Shewing signs of improvement.)

Alexandria (Mr. J. Daverin). Sown 4th July, 1905. Failed to germinate.

Beaufort West (Messrs. B. J. Pienaar & Son). Sown August. Result: Fair. Grass has grown all right so far, but is too short to reap.

Fort Beaufort (Mr. Lex Smith). Sown in August. Grass failed owing to drought.

Herbert (Mr. J. G. Wilkinson). Sown March and December. Result: Fair. Might do well if allowed to root well before grazing: a nice fine grass.

East Griqualand (Mr. W. E. Pitout). Sown 5th January, 1905. After germinating disappeared, as though destroyed by insects.

East Griqualand (Mr. C. W. Potts). Sown September. Result: Fair. Fairly suitable for district, but won't pay.

East Griqualand (Mr. F. A. G. Leisching). Sown March 1905. Seed failed.

East Griqualand (Mr. J. T. Moxham). Date not given. Destroyed by hail.

East Griqualand (Mr. A. W. Sephton). Sown 12th November. Destroyed by fly in December.

TIMOTHY.

This is one of the best grasses in Europe, and here, although it has done well in some cases, it cannot be regarded as promising as the rye grasses or cocksfoot.

The report from Mr. O. M. Barry, Stellenbosch, with whom certain of the other grasses did well, is especially interesting as being a direct comparison.

The reports are as follows:—

Stellenbosch (Mr. O. M. Barry). Sown 10th August. Result: Bad. I do not think crop suitable, nor will it pay in this part.

Cape (Mr. P. van der Byl). Sown middle of May. Result: Indifferent. Grazed by cattle in January. I do not think it is suitable for district.

Worcester (Mr. P. R. Rabie). Sown early in June. No remarks.

Knysna (Mr. C. W. Thesen). Sown 20th May, 1905. Result: Fair. Rust at first and then dried up a good bit (April 16th—Now improving).

Knysna (Mr. Geo. Parkes). Sown 18th May. Result: Indifferent. I do not consider it a promising grass.

Tullagh (Mr. G. J. Evrard). Sown 15th July. Result: Good. Very good for sheep in paddock.

East Griqualand (Mr. A. W. Sephton). Sown 10th November. Result: Indifferent. Cannot pass an opinion, as only a few plants came up.

East Griqualand (Mr. W. E. Pitout). Sown 6th January, 1906. Destroyed by insects.

Adelaide (Mr. A. Barker). Sown August or September. Result: Good. Yes, I consider grass suitable if once established.

RESCUE GRASS.

This grass, known by many aliases such as Schrader's brome, winter grass, tuin gras, Van der Merwe's gras, Australian oat grass or prairie grass, is highly valued both in the United States and Australia. It is very common with us in orchards and gardens, but its great possibilities do not seem to have been perceived, and it is seldom or never grown for its own sake. As a winter grass resisting frost and growing in very cold winter, it has no equal, and may either be grazed or cut green as the very earliest feed. It dies down as the spring and summer grasses come on. Many instances of its success and suitability besides these given below are known, and it may be confidently recommended. It will be noted that at Elsenburg the grass gave nearly three tons of hay to the acre.

East Griqualand (Mr. W. C. Potts). Sown 16th December, 1905. Result: Good. I consider it suitable and will pay in this district.

East Griqualand (Mr. L. Conolly). Sown 20th February, 1904. Result: Good. I consider this grass superior to any other grasses in this district.

East Griqualand (Mr. W. F. Raw). Sown 26th November, 1904. Result: Good. This grass will pay; is suitable here; grazed down during the winter, and is now growing strongly again, November 26th.

East Griqualand (Mr. W. H. Moxham). Sown 1st December, 1904. Result: Good. This grass will pay and is suitable to district.

East Griqualand (Mr. W. E. Pitout). Sown 7th February, 1905. Died off owing to unfavourable weather a week afterminating.

Ugie (Mr. H. Dorning). Sown 15th November, 1905. Result: Good. On dark sandy soil not irrigated. The grass in May stood about 12 inches high, beautifully green, and fresh and luxuriant, and is, I think, a splendid winter grass, and seems adapted to the soil where it is sown.

Hope Town (Mr. J. Badenhorst). Sown 6th April. Result: Fair. Destroyed by locusts before seeding, but think it suitable as far as it had grown.

Kimberley (Mr. C. E. Pohl). Sown middle of March. Result: Fair. Stood drought better than barley; may be suitable where you have plenty of water.

Herbert (Mr. J. G. Wilkinson). Sown November. Result: Indifferent. Will pay where you have sufficient water or a sufficient rainfall.

Barkly West (Mr. G. H. Collen). Sown last summer. Result: Indifferent. As irrigation is necessary, barley is better.

Barkly West (Mr. Geo. Paton). Date not given. Result:

Good. A wonderful grass, with the thermometer down to 20 degrees: it averaged $1\frac{1}{2}$ inches growth per week.

Beaufort West (Mr. Paul Nel). Date not given. Result: Good. Grows splendidly even in extreme cold. I am sowing 60 lbs. of seed this season, and will report later.

Beaufort West (Mr. D. B. Menne). Sown 6th February, 1905. Result: Fair. Fair, but cannot express a positive opinion.

Tarkastad (Mr. F. T. Mortlock). Date not given. Seed failed owing to excessive drought.

Colesberg (Mr. Alex. Robertson). Sown January, 1905. Unable to pass an opinion owing to drought.

Richmond (Mr. F. P. Hugo). Sown August, 1905. Result: Fair. I think it will pay if sown in vlel after flood.

Uniondale (Mr. J. H. Kritzingen). Date not given. Result: Good. Cannot be beaten as a winter grass. Not affected by frost.

Knysna (Mr. C. W. Thesen). Sown 3rd May, 1905. Result: Good. Reaped 54 lbs. of hay: grass now looks like a plot of barley in good condition.

Knysna (Mr. T. O. W. Read). Sown April, 1905. Result: Fair. Consider it suitable when sown on sweet veld without manures, or on sour veld with manures.

Stellenbosch (Principal. Elsenburg). Sown September and October. Result: Doubtful. Will yield 5,800 lbs. to the acre; doubtful if it will pay, but might, subject to certain conditions.

East London (Mr. R. N. Marillier). Sown October 20th, 1905. Seed started well, but owing to continued drought, seems to be dying off.

AWNLESS BROME GRASS (*Bromus inermis*)

gave curiously contrary results, and seems to have been the victim of accidents even more than ordinarily. As this grass has at times been praised very highly, it is well to have a number of separate reports, especially in view of the much more satisfactory results from a closely related species—the Rescue grass.

Craddock (Mr. H. Abrahamson). Result: Good. Grew very well where irrigated and gave plenty of seed, but other crops, such as barley, are better.

Craddock (Mrs. E. Moorcroft). Date not given. Result: Indifferent. Came up badly, and did not make much growth, owing to drought.

Beaufort West (Mr. Paul Nel, Paardenkraal). Sown April, 1905. Seed did not germinate, sowing again.

Herbert (Mr. J. G. Wilkinson). Sown December, 1904. Destroyed by locusts and then covered by sand; it never recovered.

Victoria East (Mr. Lex Smith, Alice). Sown August, 1905. No result: am sowing again in March.

East Griqualand (Mr. F. O. G. Liesching). Sown 15th November, 1905. Result: Indifferent. Very slow and not to be compared to Cocksfoot.

Tulbagh (Mr. J. F. Theron). Sown middle of June, 1905. Seed failed to germinate.

Knysna (Mr. G. Parker). Sown 18th May. Did not do well here.

GOLDEN CROWN GRASS (*Paspalum dilatatum*).

In many parts this grass will soon lose its experimental character, as no doubt seems to exist of its good qualities and suitability to this country. Indeed, merchants are already stocking and advertising it, and to those who require a perennial fodder crop which may be either cut or grazed, and who find that lucerne does not answer, cannot be better advised than to try this grass which is rapidly earning a reputation second only to that of the king of forage crops. This grass has a most unusual facility for adapting itself to different conditions. The only draw-back appears to be the difficulty in raising the grass from seed in the first instance, but it is one well worth some little trouble to overcome. Considerably over a hundred farmers have received packets of this grass for trial, but it is yet too early to look for their reports.

THE AGRICULTURAL UNION OF CAPE COLONY.

Ninth Annual Congress.

(Continued from page 83.)

SECOND DAY, TUESDAY, 29TH MAY, 1906.

Congress resumed. The chair was again occupied by the President, Mr. C. G. Lee, who, in moving the adoption of the Annual Report, presented at yesterday's meeting, congratulated the delegates present on the amount of business already accomplished, at the same time pointing out the fact that there still remained a number of interesting and important matters to be dealt with. The motion was briefly seconded by Mr. Evans, and adopted unanimously.

RAIL CHARGES ON SHOW STOCK.

A motion introduced by Mr. Kidwell (Aliwal North), and seconded by Mr. Richards (Sundays River): "That, in order to encourage Agricultural Shows, railway charges for breeding stock for Show purposes be amended," was subjected to considerable discussion.

Mr. Kidwell thought that the object of all Shows was that stock should be exhibited for purposes of sale, and he, therefore, considered that a suggestion should emanate from the Union to the effect "That stock sent to Shows, and there sold, should be delivered to purchaser at nearest railway station, free of charge, for carriage,"

Mr. Rawbone pointed out that already the farmers enjoyed railway facilities in this connection, such as were granted in no other country in the world.

Mr. Brown (Port Elizabeth) instanced the difficulty of such a course as that proposed, as the railway has to arrange in regard to trucks some time in advance of the Shows, and cases may arise where cattle, on changing hands, might have to be sent 800 miles having only come 20.

Dr. Hutcheon strongly objected to the motion on the ground that Government could not be expected to assist in the carrying of stock brought for sale merely, and not for show.

Mr. Bayly (Britstown) thought the present facilities sufficiently generous. Full fare is charged on the forward journey, but if the stock is not returned, a refund of half-fare is made.

On the motion of Mr. Starke (Western Province), the matter was eventually referred to the Executive.

CIRCLE SHOWS.

Mr. Kidwell (Aliwal North) moved, and Mr. Van Aardt (Aliwal North) seconded, "That the Union appoints certain centres for holding Circle Shows, at which the experts of the Agricultural Department shall attend for the purpose of giving lectures and demonstrating in the various branches of Agriculture."

Mr. Le Sueur (Caledon) thought that the people who attended a Show came for that specific purpose, and would not be induced, at that time, to attend other meetings. He referred to the fact that at Caledon a series of lectures, on the lines indicated, had been arranged, but not at the Show time, and he suggested this as the better arrangement.

Mr. Douglass (Koonap) suggested that judges at the various shows be asked to explain the reasons of their awards, and generally to give all the help and information possible to exhibitors, so as to enable the latter to more readily discover and rectify the faults in their exhibits. He thought that the judges, as well as the Government experts, might be called upon to give occasional lectures.

Mr. Lee explained that in connection with the Zwart Ruggens Farmers' Association, lectures have already been delivered, much to the advantage of the young farmers of that neighbourhood. He agreed with the necessity for providing opportunities for instruction of this kind, but not in connection with Shows.

Mr. Douglass (Koonap) moved as an amendment: "That the Executive be authorised to arrange as far as possible for lectures by experts, including judges at Shows." This, on being seconded by Mr. Le Sueur (Caledon) was carried.

On the continuation of the discussion on this subject Mr. de Wet (Robertson) spoke of the necessity of having, in all cases, experts as judges, and

Mr. Le Sueur (Caledon) gave it as his opinion that occasionally the position of judge is accepted by a not fully competent man, merely for the honour of the appointment.

Mr. MacDermott (*Agricultural Journal*) was of opinion that one way of solving the question lay in creating a Judges' Association. He suggested that the Union should formulate a scheme for a competent Judges' Association, which body would supply judges for all Shows.

At this stage of the proceedings Mr. W. H. Hockly, President of the Central Farmers' Association, was introduced by the President, and accorded a hearty welcome.

THE REGISTRATION OF BRANDS.

Dr. Hutcheon, in presenting the Sub-committee's Report said that there were two points which needed to be particularly referred to. First, that it was not intended to recommend that every stockowner should brand his cattle, but that he should be required to register his brand if he used one; and, second, the impossibility of permitting every farmer to select his own brand. There must be a system in the selecting and registering of brands, otherwise the Act could not be operated at all successfully. It may be possible, in a few cases, to register existing brands, which have been held by certain families for generations, but in the great majority of instances an applicant for registration must be content to take the brand allotted him.

The Sub-Committee's Report reads as follows :—

Your Committee, in considering the amendment of the existing Registration of Brands Act in this Colony, came to the conclusion that the Act is in several ways incomplete and unsatisfactory largely owing to the permissive element. They therefore feel that, in order to make the Act workable and meet the full needs of the people, the registration of brands should be made compulsory over the whole of the Colony.

It may be pointed out, however, that such a compulsory measure would not necessarily mean that every stockowner must use a brand. That could be left optional. All that need be made compulsory is that every owner of stock using a brand should have it registered, and, to avoid confusion, some system should be adopted that would be clear and workable and, while giving protection to the owner, be so arranged that it would be applicable to the needs of the whole Colony. This has been found necessary in most countries where pastoral industries prevail, and your Committee feels that sooner or later the same need will be felt here.

The next consideration is the method to be recommended for adoption in case of a general compulsory Act being passed. In reviewing the various systems which have been adopted from time to time in other countries situated as we are, it appears to your Committee that the most complete and adaptable one presented was that known as the "Three Piece System," formulated in the Queensland Act of 1872, and quite recently in the neighbouring Colony of the Transvaal. An excellent and lucid description of that system was published in the *Transvaal Agricultural Journal* for July 1904, written by Mr. D. N. Johns, District Commissioner, in the course of which he says :—

In Queensland, in 1872, the Symbol System was abolished and the "Three-piece" system introduced. Cattle stealing had become so rife, and it was so impossible to check "faking" of symbol brands, and symbols were so difficult to trace or identify, that owners were driven to adopt the "Three-piece" system.

It involved the alteration by stockowners of the whole of their brands throughout the Colony, and it took many years for the stock throughout the Colony already branded in the old style to disappear.

"Although I am sanguine about the good that will result from the operation of this Act in suppressing crime and protecting property, it will be necessary that all stockowners should distinctly understand that a large measure of the success of the Act will depend upon their efforts to assist the Department," so wrote Mr. Patrick H. Gordon, Registrar of Brands, in his pamphlet of 1872, circulating the Act. To Mr. Gordon the Queensland stockowners gladly acknowledge their indebtedness for the successful introduction of the "Three-piece" system, and the careful amendment from time to time of the Act of 1872 as was found desirable. His words of caution are equally applicable to our own stockowners. His sanguine forecast was fully justified; for in a country containing several million head of cattle and consisting of a small and scattered population, with a mere handful of police, cattle stealing rapidly decreased, and is to-day almost stamped out.

Accordingly, the adjoining Colony of South Australia adopted a similar "Three-piece" system, but with brands composed of two numerals and one letter, so that stock could not be moved across the border without the country of origin being disclosed by the hides (a similar purpose can be served here by the district letters).

Western Australia has recently amended its law, as has also New South Wales, both borrowing largely from the Queensland system; and in the vast ranching areas of the New World, such as Montana, in the United States of America, and the North-West Territories in Canada, the "Three-piece" system is being adopted.

To sum up: The following are the reasons why the "Three-piece" system of two letters and one numeral, of standard pattern and on one line, has proved so satisfactory, and is displacing other systems:—

1. That it supplies, already designed and awaiting application, sufficient distinct brands for all stockowners.

2. That the characters being of standard pattern, and exactly on one line, are not interchangeable by addition, and, if altered, can be detected by any eye, on sight of the brand.

3. That the brands can be readily indexed, so that the brand can at once be turned up (with the registered owner's name and address if it be allotted) in the "Brands Directory"—a book which could be published annually by the Department of Agriculture at the lowest possible price, copies to be at the office of every Magistrate, Postmaster, and Poundmaster for inspection by the public at a fee of one shilling. At the end of every quarter all brands allotted, with registered owners' names and addresses, could be published in the *Gazette*, from which lists the Brands Directory could be annually compiled.

The registered owner of the brand appearing on an animal is *prima facie* the owner of the animal; and when two or more brands appear on the same animal, to determine who is the last owner, a definite order of the portions of an animal is laid down. And brands must be applied in this order, so that the last brand, and its owner, can be distinguished.

For example, if an ox has a brand on the near rump (the first portion) and another immediately below it, or if there be not room below, then on the off rump, this latter brand is the brand of the last owner. And hence a man, purchasing a branded beast from a vendor in his own district, will seldom trouble to re-brand it; for, if impounded, the vendor will be notified, since his brand appears last in order upon it, and, if stolen or strayed, will be as easily traced through his brand.

In this country one sees the majority of animals branded in many places; some of the brands are symbols, generally undecipherable; and there is no order of parts to disclose the transactions that have taken place, or who is the last owner.

The "Three-piece" system would effect an immediate decrease in these troubles. For while no one is compelled to brand at all, yet the first person who elects to brand an animal, must do so on a certain definite spot (in the case of cattle on the near rump); and while a purchaser is under no obligation to affix a further brand, yet, if he elects to do so, he must apply the second brand one and a half inches below the first brand, or if there be not room to do this, then in the case of cattle, on the near rump, which is the second portion, and so on. The *prima facie* owner of the beast is thus always clear.

Diseases being rife in this country, and protection, by quarantine, of a district so often necessary, it would be desirable to provide a system by which the district of origin of a beast might be determined at a glance by any person. For this purpose a letter (usually the first or last letter of the name of the district) could be assigned to each Magisterial District. This letter should be the first of the two letters of every brand in that district. Thus P 3 K in the Transvaal is the Potchefstroom District brand—L 7 T is that of Lichtenburg. This also enables the brands for the district to be registered at the local Magistrate's Office. When animals are moved out of the district in which they were last branded the fact remains evident on their hides.

The characters composing a brand may not be less than one and a quarter inches in height; but they may be as much larger as the owner desires. The Queensland Act of 1872 prescribed much larger minima both for horses and cattle brands, but successive amending Acts have now reduced both to the above size, which has accordingly been adopted here.

Any person who desires to brand his stock could then go to the Magistrate's Office in the district in which the place where he keeps his stock is situated, and, on payment of 5s. obtain forthwith a certificate on which appears a diagram of the brand allotted to him, which would shew the blacksmith the exact standard pattern of the characters.

The first letter of his brand must be the district letter.

The numeral and second letter he could select for himself, if unallotted.

Animals when sold out of Pound must be branded in the proper place by the Poundmaster before giving delivery. Each Pound in a district will be allotted a separate brand by the Magistrate. The first character will be a Diamond, and the others to consist of the Dominant letter of the district and a Numeral.

The object of having Pound brands markedly distinct from private brands is to prevent a charge, or even suspicion, of theft attaching to the person in possession of missing animals which have been sold out of Pound.

Every Poundmaster must notify the registered owner of the brand appearing last in order on an animal immediately on its being confined in his Pound; and when he has reason to believe the animal belongs to any other person he must notify him also.

Poundmasters, butchers, and auctioneers must record in their books the brands of animals which are impounded, slaughtered, or dealt in by them respectively; and should any animal have an altered or defaced registered brand upon its hide he must report the fact to the nearest constable or Inspector of Brands, and allow forty-eight hours to elapse thereafter before slaughtering or disposing of the animal.

Your Committee is therefore of opinion that in any amendment of the existing Brands Registration Act the principle of Compulsory Registration should be applied over the whole of the Colony; that provision should be made for the gradual introduction of the "Three Piece System" of branding; and that mutilations, such as cutting off the ears or any part of an animal as a mark or brand, should be made illegal.

Mr. Malan (Transvaal) detailed his experience of the working of the Brands Act in the Transvaal. In this connection they were a little ahead of the Cape Colony. It was quite impracticable to select a brand and then to register same. Difficulty had arisen in the case of stock changing hands, but this had been obviated by the purchaser obtaining a certificate from the seller, and thus there was no need to continually re-brand stock. Where such a certificate cannot be produced, and cattle are publicly sold, the proceeds are remitted to the original registered brand holder. What is required, Mr. Malan contended, is a uniform Branding Act for the whole of South Africa, and then cattle can be traced anywhere.

Mr. Daverin (Port Elizabeth) asked if a brand already in use for, say twenty-five years, could be registered and retained?

Dr. Hutcheon, in reply, said that any brand already in use, of which there was no existing duplicate, could be registered, but no renewal of such brand would be permitted after the demise of the first registered holder.

Mr. Douglass (Koonap): How is this Act to be worked with the natives?

Dr. Hutcheon: Each native location would have a brand of its own in Italics, and with other special distinguishing marks.

Dr. Hutcheon moved, and Mr. Bayly (Britstown) seconded the adoption of the report. The resolution was carried without dissent.

Mr. Lee explained that business elsewhere necessitated his temporary absence from the Congress, and Mr. Daverin (Port Elizabeth) was voted to the chair *pro tem*.

GOVERNMENT GRANT.

The next matter for consideration was a recommendation from the Bredasdorp Farmers' Association to the effect that "Government be approached with a view to bringing about an increase in the contribution to Agricultural Societies."

Mr. Brown (Port Elizabeth) said there was another matter of

a like nature on the Agenda which it would be advisable to take at the same time. It was a recommendation from the Oudtshoorn Farmers and Fruit Growers' Association, that "Government be requested to reconsider its decision in granting only three-tenths of the prize money awarded at Agricultural Shows, and that the usual five-eighths contribution be given in future."

On the motion of Mr. Evans, seconded by Mr. Bayly, the matter was referred to the Executive, with power to act.

LUCERNE HAY.

The Sundays River Farmers and Fruit Growers' Association submitted the following suggestion for the consideration of the Congress: "That a product of such importance as Lucerne Hay should be judged at Agricultural Shows by special judges, and that such judges should be experienced growers"

Mr. Richards (Sundays River) said he had been requested to bring forward this matter so that competent men might be secured for the judging of lucerne hay. The resolution was the outcome of what was considered an error in the award for the class at the last Port Elizabeth Show. He had been making experiments of late in putting lucerne on Shows with the view of testing the capability of the judges, but he had learned nothing except that the judges, in some cases, lacked experience. We do not want men as judges of lucerne who are not practical and experienced.

The resolution was seconded by Mr Evans, who enquired as to the difference between dried lucerne and lucerne hay.

Mr. MacDermott (*Agricultural Journal*) said there was a great difference between dried lucerne and lucerne hay. The demand for this fodder had resulted in a lot of immature hay being placed on the market. Lucerne hay needed to be well matured before becoming of full value as fodder. Unfortunately it is too often judged by its appearance, by dealers and consumers as well as at shows, rather than by its nutritive qualities, and such judgments give rise to wrong impressions.

Mr. Le Roux (Oudtshoorn) spoke of the difficulty in discerning which is old and which new hay when both are compressed. In his experience he found the older the hay the better, provided the hay was properly matured.

Mr. De Wet (Robertson) thought that consumers should be the judges rather than the growers, as, in his opinion, the latter were not up to the mark in the preparation of the hay.

Mr. Douglass (Koonap) moved "That it be remitted to the Lucerne Growers' Association to recommend the judges for lucerne hay at the various Shows."

Mr. Butler (Cradock) supported this motion, and referred to the formation of the Lucerne Growers' Association at Middelburg, Cape, who have applied to the Military with a view to discovering the most suitable class of lucerne hay to be produced.

The original motion was then withdrawn, and Mr. Douglass's amendment was carried by the casting vote of the Chairman.

REGISTER OF JUDGES.

A resolution moved by Mr. Brown (Port Elizabeth), and seconded by Mr. De Wet (Robertson), was briefly discussed and carried: "That the Executive prepare a list of competent judges to be available for the use of Agricultural Societies."

DEFINITION OF "COLT."

Mr. Brown (Port Elizabeth), in opening the discussion on this point, referred to the difficulty which had arisen at the last Port Elizabeth Show. Enquiries had been made, in various quarters, as to the meaning of the term, and no less than six conflicting definitions had been received. It was said—

1. That a Colt is a young male horse, either entire or gelding, up to 5 years.
2. A Colt is an untrained animal up to 3 years.
3. A Colt is a Colt up to 4 years, whether trained or not.
4. A Colt is an unbroken male horse under 4 years, entire or gelding.
5. A Colt is such at 4 and under 5 years. Does not think includes gelding.
6. A young horse ceases to be a Colt after cutting its incisors.

Mr. Guthrie (Port Elizabeth) moved, and Mr. Starke (Western Province) seconded: "That this Union moves, for the guidance of all Societies, that in future the term "Colt" shall be taken to apply to a young entire horse under 4 years."

Mr. Van Zyl (Britstown) considered the limit of the colt stage should be 3 years, and in this view he was supported by Messrs. Le Roux (Caledon) and De Wet (Robertson).

Mr. Guthrie's motion was eventually put to the meeting, and carried by a considerable majority.

SHOW DATES.

On the nomination of Mr. D. M. Brown, the following were appointed a Sub-Committee to undertake the arranging of Show dates so as to avoid clashing and confusion:—

Mr. MacDermott and Dr. Nobbs (Government Representatives), with Messrs. Brown (Eastern Province), Persse (Western Province), Butler (Midlands), and Col. Cuming (Border).

LOCATIONS ACT.

Mr. Douglass (Koonap) moved : " That this Union urge upon the Government to give consideration to the resolutions adopted at the Farmers' Congress *re* Amended Locations Act, which should greatly tend to improve the methods of farming in parts of the Colony." He said the present Act was full of anomalies. The Attorney-General himself had given two different readings, and he thought Government should be made aware of the fact that the Act was not working satisfactorily.

The motion was briefly seconded by Mr. Evans, and supported by Mr. Daverin (Port Elizabeth), who also referred to the indefiniteness of the construction and reading of this Act. Carried unanimously.

LIGHT WINES.

Mr. Louw (Stellenbosch) moved, and Mr. Starke (Western Province) seconded, a resolution which provided : " That Government be asked to grant better facilities for the sale of light, unfortified Colonial wines." The mover said that what was required was cheap licenses for the sale of light wines, and he was assured the result would be of advantage to the manufacturer, and that there would ensue a diminution in the cases of drunkenness in all the towns of the Colony. He gave figures to shew the difference in prices at which Cape wines were sold. For light wines the manufacturer received £7 per leaguer, or say 2½d. per bottle. After two years the merchant sold for 16s. per doz., less 15 per cent., or 1s. 1½d. per bottle. The hotel-keeper, again, re-sells at from 3s. to 3s. 6d. per bottle. In the case of Hermitage the farmer receives £6 per leaguer, or 2d. per bottle. The merchant sells at 1s. 1½d. per bottle, and the canteen retails finally at 3s. per bottle. He has known cases in which wine has been bought from the farmer at £4 per leaguer, and retailed at 8d. per bottle, or at the rate of £25 per leaguer. He considered every street corner should have its restaurant licensed to sell light wines, and thus the importation of spirituous liquors would be reduced, and the Colonial industry placed on a prosperous footing.

Mr. Starke, in briefly seconding the motion, said his heart was in the wine, though he rarely touched liquor of any kind.

Mr. Malleson thought there was a good deal in what Mr. Louw had said, though his figures were not quite correct. What is required in the Western Province are facilities for the sale of light wines only, at low rates ; and heavier licences to houses selling other liquors.

Mr. Van der Byl (Stellenbosch) informed the meeting that the question had been considered by the Horticultural Board and a Committee appointed. The matter had been fully discussed with a view to benefit the wine farmer. At present there is no induce-

ment to produce a really good wine at a moderate price. Adulteration is very prevalent and it is required to provide against this. A good deal of opposition had been experienced from the Temperance Party, but he thought they had not gone into the matter closely. He considered that the supplying of light Colonial wines to Natives was better than total prohibition.

Mr. Willmott (Cape Flats) in supporting the motion said that its object was to bring the wine farmers into closer touch with the consumers. The feeling in the West was that some better facility was necessary to enable the farmer to produce a light unfortified wine and to get it into direct consumption, and not, as at present through the wine merchant.

Mr. Evans thought that the figures quoted certainly instanced a grievance, but he strongly objected to the idea of supplying the native with liquor of any kind, however light. He was afraid of harm resulting from any attempt to alter the present system.

Mr. Lategan (Worcester) said this matter was one of life and death to the wine farmers. They were making good wines, but there was no opportunity of bringing same at a reasonable price to the consumer. The consumer pays a huge price which the wine farmer does not get the benefit of. He considered the facilities asked for reasonable and necessary.

Mr. Creed (Cape Flats) sympathised with the object of the motion, having had a long experience in the Excise Department of the Colony. He thought, however, that the resolution might be amended to read: "That Government be asked to introduce a Bill into the present session of Parliament by which better facilities for the sale of Colonial light unfortified wines be ensured." This was seconded by Mr. Lategan.

Mr. Butler (Cradock) as a life-long abstainer, though generally in full sympathy with all that tended to improve Agriculture, expressed himself as strongly opposed to the passing of such a resolution as that before the Congress. He would like to see fruit turned into other and more legitimate channels of sale. He felt assured that if licences of the kind suggested were granted, the result would be the enlargement of the drinking facilities of the people, with consequent danger to ladies and young men.

At the close of the discussion Mr. Louw, with the consent of his seconder, withdrew his motion in favour of Mr. Creed's amendment, and the latter on being put to the meeting was carried by 13 votes to 7.

The Rules, as drawn up by the Executive, were submitted and adopted, after which, on the motion of Dr. Hutecheon, the Congress adjourned for lunch.

AFTERNOON SESSION.

On resuming at 2.30 p.m. Mr. Louw (Stellenbosch) opened a discussion on

WINE ADULTERATION

by suggesting that Government be approached with a view to legislating against the addition of cane sugar in the manufacture of wine.

Mr. Malleson said this question had been before the Vine and Fruit Growers' Association, and the whole matter had been thoroughly gone into. A decision had been arrived at to leave it in the hands of the Government, who are bringing in a Bill in regard to Adulteration. The question is a debatable one as to whether the addition of cane sugar is adulteration, and there was such a difference of opinion on the point, that he would move that the matter be left entirely in the hands of the Vine and Fruit Growers' Congress.

This was seconded by Mr. Rogers.

Mr. Creed (Cape Flats) said that the question of sugar adulteration had been receiving the consideration of Government for the past 16 years, but so far nothing had been done. He considered it was of the greatest importance that the wines consumed in this country should be pure. The addition of cane sugar must be admitted to be adulteration and he therefore strongly supported Mr. Louw's suggestion.

Mr. Le Sueur (Caledon) thought the matter should be dealt with by the Union which represents the interests of wine as well as other farmers.

Mr. Malleson opposed this view and said the question should be left to Viticulturists to discuss and decide, it being as yet uncertain whether the addition of sugar could be regarded as adulteration.

Mr. Louw (Stellenbosch) explained that the Vine and Fruit Growers' Congress negatived a similar resolution, but this, he thought, was due to the wine farmers present being in the minority, and to some of them not being experts.

Mr. Malleson: Are we in order in discussing the competency of the Vine and Fruit Growers' Congress?

Mr. Brown (Port Elizabeth) pointed out that to pass such a resolution this Union would place itself in the position of a court of appeal from a decision of the Vine and Fruit Growers' Congress. He therefore supported Mr. Malleson's motion, as he thought it would be better if this Congress expressed no opinion on the matter.

The discussion was then closed by Mr. Lee (President) suggesting that, owing to the nature of the subject, it would be advisable that same be left over for later consideration.

To this Messrs. Louw and Malleson agreed.

THE EXECUTIVE.

The nomination and election of officers and of the Executive for the current year then took place, with the following results:—

President: Mr. C. G. Lee; *Vice-Presidents*: The Hon. P. W. Michau and Mr. J. Rawbone, Cape Colony; Mr. F. G. Nicholson, Transvaal; Mr. J. A. Edmonds, Rhodesia; Mr. W. J. Palmer, Orange River Colony; the Hon. J. Baynes, Natal. *Executive Committee*: Messrs. F. C. Bayly, H. H. van Breda, D. M. Brown, Oscar E. A. Evans, Hon. A. J. Fuller, M.L.A., P. R. Malleson, P. Ryan, W. G. Sieberhagen, M.L.A., Hon. Dr. Smartt, M.L.A., J. Daverin, D. de Wet, W. van der Byl, Colonel Cuning, Hon. W. Rogers, M.L.C., A. W. Douglass. *Government Representatives*: Dr. Hutcheon, Dr. Nobbs, Messrs. Lounsbury, MacDermott, Hannon, Pillans, and Borthwick. *Delegates to the Inter-Colonial Congress*: Messrs. Lee, Michau, Evans, De Wet, Cuning, Ryan, Brown, Malleson, Daverin and Van der Byl.

FENCING ACT.

Dr. Hutcheon presented the Congress with copies of the Fencing Law Amendment Act, 1905, which was promulgated on the 8th June, 1905.

Some discussion took place on the meaning and interpretation of this Act, and

Mr. Starke (Western Province) enquired whether, having erected a fence which is made use of by a neighbour to attach jackal-proof fencing, he should not be called upon, and compelled to pay a part share thereof?

Mr. Le Sueur (Caledon), in reply said the necessity and advantage of fencing is not generally understood. You put up a fence which benefits a neighbour, but you get no return. He had tried, but unsuccessfully, to get the Act proclaimed in certain districts, where it is at present permissive. He contended that part of the Act should be of general application.

Dr. Hutcheon had very little doubt but that the small farmer would follow the example of his neighbour in erecting jackal-proof fencing. It might be a slight hardship upon those who have already erected fences to be called upon to share the cost of new fencing, but this was inevitable under the conditions of the Act.

Mr. Douglass (Koonap) felt that this Act, which is of advantage in some districts, might not be of value in others, especially where ostriches were farmed. He, therefore, disapproved of a general and compulsory Act.

Mr. Le Roux (Oudtshoorn) said that in his district it was found impossible to introduce this Act.

Mr. Douglass (Koonap) moved, and Mr. Starke (Western Province) seconded: "That this Congress disapproves of a Compulsory Jackal-fencing Act."

This was carried unanimously.

MULE BREEDING.

Mr. Faure (Worcester) spoke of the necessity for improving the class of Mules required in the Colony, and of increasing their number, and moved: "That Government be requested to import a suitable class of donkey stallions, from 14 to 15 hands, to improve the mule breeding industry of the Colony."

Mr. Starke (Western Province) seconded the motion.

Mr. Lategan thought it was too much to go to Government for everything, and to expect every request to be granted. Was there not sufficient enterprise among the farmers to move in this matter for themselves?

Dr. Hutcheon explained that the loss to the Government on the last importation was small, and, in his opinion such importation was one of the best things the Government had ever done. There are certain areas not well adapted for the breeding of horses but eminently suitable for the breeding of Mules. The size of the Mules of course depends upon the size of the mare with which the Jack is mated. He thought that if Catalonian Jacks are well selected it would be a good thing for the Colony, and the Government should sustain no loss.

Mr. Le Sueur (Caledon) enquired whether this scheme of importation would not come under the Co-operative system?

Dr. Hutcheon in reply said he did not anticipate any difficulty in this connection. It would be better that Government should undertake the importation.

The motion was then put and carried.

THE HONORARY SECRETARY.

Mr. Malleson took advantage of the occasion offered by a pause in the proceedings to eulogise the services rendered by the Hon. Secretary, Mr. D. M. Brown, to the Union particularly, and to the interests of Agriculture throughout the Colony generally. He suggested that as some slight recognition of his work the name of Mr. Brown be added to the list of Vice Presidents.

Mr. Ryan strongly supported the suggestion and also referred to the long and effective services rendered by the Hon. Secretary.

Mr. Brown thanked both these gentlemen for their kind remarks, which he greatly appreciated, and for the proffered honour. He however did not feel like falling out of active work yet and so would prefer, for the present at any rate, not to accept the position for which he had been so kindly nominated.

IRRIGATION BILL.

On the motion of Mr. Starke (Western Province) seconded by Mr. Daverin (Port Elizabeth) it was decided: "That this Congress do not discuss the Irrigation Bill which appears on the Agenda."

The following resolutions were then moved and carried: -

A vote of thanks to the Mayor and Corporation for the use of the Hall for the purposes of the Meetings.

A vote of thanks to the Agricultural Department for assistance courteously rendered, and to the local Committee for the care and trouble taken in making the preliminary arrangements.

A bonus of thirty guineas to the Hon. Secretary towards expenses of clerical assistance incurred during the year.

A special vote of thanks to Dr. Hutcheon for his attendance at the meetings and his interest displayed therein.

A vote of thanks to the Press for the careful and detailed reports appearing in the daily papers.

It was resolved that it be left to the Executive to decide upon the time and place of the next Congress.

The proceedings of the Congress then terminated.

TOBACCO SEED FOR DISTRIBUTION.

By DR. ERIC A. NOBBS, Agricultural Assistant.

Competent authorities have recently expressed the opinion that the next few years will see a revolution in the tobacco industry in the Colony, and that there is every reason to believe that while the days of the old Boer roll are numbered, a good demand will arise for a different class of tobacco of superior quality, worth a much higher price per pound, and, fortunately, of a sort which can readily be grown here. Indeed, the demand for this lighter leaf already exists, and good prices are offered for a fine wide leaf with thin white veins, and cured to a rich lemon to amber tint, very different to the thick, narrow, long, thick-ribbed, dark-brown article now so plentiful and so cheap.

But this more valuable leaf, out of which the grower can make a better profit, must be grown in a different manner to that usually adopted, yet, in a way, requiring no peculiar skill beyond the means of any ordinary farmer.

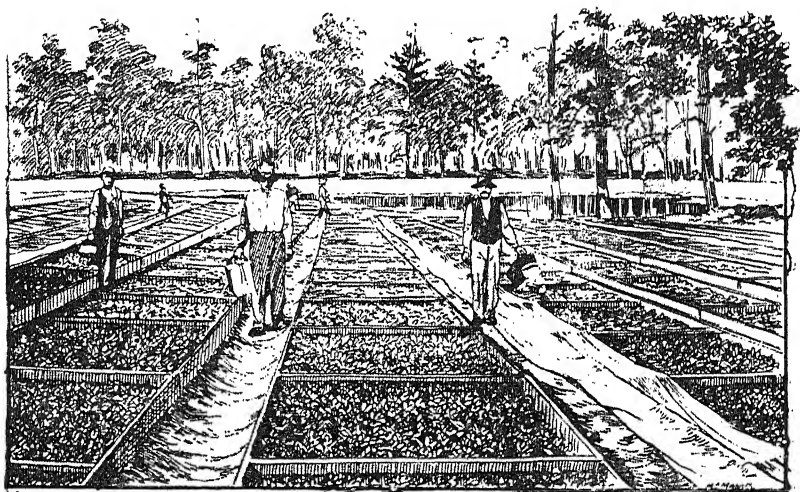
THE MODERN TOBACCO SEED BED.

The first point in the preparation of the seed beds is the burning of the land upon which they are to be placed by piling up heaps of dry bush or rubbish, and letting it burn for a day or more until the ground is baked at least three inches down, lighting the fire on the lee side so that it may burn the more slowly. Mix the ash well in with the baked soil, and prepare a fine loose seed-bed. Wet this thoroughly with a watering can, and sow the seed mixed with ashes so as to distribute it very thinly. Cover the seed by sprinkling light clean sand or earth over the bed, say about one-eighth of an inch deep. One ounce of seed should be sown on 50 square yards of seed-bed, and from this sufficient plants should be obtained to fill about eight acres of land if put three feet apart in rows 3 feet 6 inches wide.

The great difference between this process and the ordinary plan is that the seed is to be sown very much more thinly than is customary. The plants should spread their lowest leaves flat out on the ground, "button out," as the Americans say, not drawn up from standing too close together. This is a very important matter if healthy plants are to be secured.

To get the best results, and also to prevent the disease which made its appearance last year in several parts of the Colony, notably in the Kat River and at Queenstown, it is an excellent plan to cover the beds with a light calico cloth in the manner alluded

to in the *Agricultural Journal* for June of this year, page 799, and illustrated here.



Tobacco Seed Beds showing frame and cloth to exclude Moth and prevent injury from disease and frost. (From Odium's "Culture of Tobacco.")

Sown as above directed, the plants come up strong and healthy and separate, not touching one another, and may then be planted out and treated in the ordinary way.

Only strong healthy plants should be selected for transplanting, and any weak or diseased plant seen in the beds should be at once pulled up and destroyed. The aim is to get sturdy plants, which will be ripe in from 60 to 90 days after transplanting.

DISTRIBUTION OF SEED.

With a view to enabling farmers to try these improved methods, the Department of Agriculture has, through the kind offices of the United Tobacco Company, South, Limited, procured a supply of the best Virginia seed of the following sorts specially recommended for trial:—Raglands Conqueror, Gold Finder, Raglands Improved White Stem Oronoka, Raglands Improved Hester Flannagan and Little Oronoka.

To farmers wishful to try any of these a quantity will be forwarded gratis on application to the Agricultural Assistant, and on the understanding that the seed will be treated in accordance with the above directions, and that a report of the results will in due course be furnished. Applicants should be careful to state the nature of the soil and the extent of land they propose planting.

In conclusion, it must be emphasised that what is wanted by the manufacturer is the pale cured leaf, not the dark inferior leaf, which is worth comparatively little.

ROOT-ROT IN ORANGE TREES.

Prevention and Cure.

BY W. E. MASTERS, Citrus Specialist, Coombs Forest near Grahamstown.

In the *Agricultural Journal* of March 1904 page 328, the matter forming the subject of the above heading was clearly explained.

The facts therein set forth comprised the truth, and nothing but the truth, nevertheless, as one who believes that no experience is of service except one shall gain such experience by his own personal efforts and endeavours, so once more in the interests of those I wish to benefit, I say that Root-rot is as easily cured as prevented.

To my mind it seems positively wicked to calmly allow the grand old Orange groves to perish, seeing there is neither necessity nor reason why they should, if one will only believe in the efficacy of the remedy.

There is no finer sight in the world than a mature citrus grove, and nothing that takes a longer time to produce. I do not believe there is one man who would deliberately and wilfully murder his grove—nevertheless murder it becomes from inability to rightly apply knowledge.

As several old groves that have escaped the ravages of root-rot in the past, are now rapidly succumbing to it; moreover as it seems to be the general opinion of the owners that root-rot is like a relentless fate that at last has singled them out for devastation, so I feel impelled to write again, and say if he who still believes root-rot is doom to citrus trees, will study the following lines, he will be a happier, and I hope a wiser man from perusing them.

To bring theory into actual practice, the intellect must be appealed to, and for this reason I will briefly shew why some trees are able to resist root-rot, while others seemingly more resistant, fail.

It is said by many that the common Lemon is more resistant than the common Seedling Orange, and that the Pamplamous and Seville are perfectly resistant to this disease.

On the hypothesis that where there is smoke there is fire, this statement may be said to be correct in practice, nevertheless it is only a partial truth, as any citrus tree will contract the disease, but some easier than others.

Taking the Pampelemous as offering in my opinion the highest resistancy to root-rot; we find its root-system adapted by nature for close compact loams, with a corresponding breathing system in leaf and branch, shewing that the natural habitat, and the best results of the Pampelemous, can only be obtained in a situation having ample and continuous moisture in perpetuity.

Its furcating tap-root system has but few surface feeders, the latter are thick and short: indicating its natural untrained root disposition to be a heavy rich loam with all its feeding close by. Its breathing system and its love of continuous moisture is proved by the contour of the tree as well as in the gross texture of its leaves and the character of their translucent pittings.

The *Seville* on the other hand is nearer the common seedling Orange. Its root-system is built for more open ground being of a more rambling or "pushing" disposition; and will flourish on less moisture than the Pampelemous.

Its roots extend outwards, cover a greater feeding area, are finer at the rootlets and contain many more laterals, all indicative of more open ground, whilst its leaf system in many instances is, but little coarser than the common seedling Orange. Its greater resistancy to root-rot, lies in the simple fact that it retains much of its natural hardiness, not having been weakened and softened by long years of selection, with *fruit* as the primary consideration.

The "*Seedling*" *Orange* is essentially a tree the outcome of selection and culture. Its existing mixed root-formation has been imparted to it by long training of climate, soil, and selection for *fruit* until its root-character has become definitely fixed in the seed itself.

Whilst it is very similar to its possible originator (the *Seville*) in many features, it has gained in perfection but lost in stamina more particularly in its root system. It is invariably selected for its fruiting capacities, with branches to carry them to perfection, thus we find dense foliage, whilst the *grower* demands low-down branches for *shade*.

The *Common Lemon* so far as concerns its mixed root-system, is far more liable to contract root-rot than any of the three trees before mentioned, but it has a great compensating feature, which under natural conditions often places it on a par with the *Seville*, and certainly ahead of the "*Seedling*" *Orange* as a resistant *tree* but I say nothing as concerns a resistant *stock*.

This statement therefore opens up the whole question of *What is the cause of root-rot?* because if the roots of the common *Lemon* are more susceptible to root-rot than the roots of the *Seedling Orange*, it stands to reason that if the latter contracts the disease and the *Lemon* escapes, there must be some very simple explanation forthcoming not only as determining the immunity of the lesser resistant tree, but for the actual cause of the disease itself.

Now I take it that all orange-growers are acquainted with root-rot, and for purposes of proving my point, I conclude also that every advanced grower to-day knows both prevention and cure. *Prevention* being the avoidance of deep planting, and water-logging the ground, as well as to keep the water away from the collar of the tree. *Cure* being to open up both collar and roots to the sun and air.

If then the cure consists of, practically, sun and air,—or to be more precise, *sun only*, because I think most growers will concede that any Orange-grove having *sun* must necessarily have *air*—then it follows that the *cause* of the disease must originate by its antipode namely, the *absence* of sun, or in other words *shade* and *moisture*.

It is well-known throughout the world that the greatest remedy for mycological, or rotting diseases, is direct sun-light; inversely therefore the originating cause, must necessarily lie in the absence of sun.

The resistancy of the common Lemon to root-rot is thus found to lie in the simple fact, that its more open habit allows the sun's rays to percolate through its foliage on to its collar and trunk, which the denser foliage of the "Seedling" does not admit of.

There is another additional factor, but as it is more of scientific interest than of practical utility I think may be omitted.

Long acquaintance with root-rot proves that the Seedling Orange succumbs more readily than the Lemon; which is because the greed of man too often studies nature only to obtain her financial benefit; the Lemon on the other hand, not being such a financial success as the Orange is not taken such *care* of! The Lemon therefore has the reputation of being more resistant to the disease, because man does not kill it by care; financial considerations frequently overlooking the laws of nature.

To prove my point, and induce belief:—If any grower knows of a tree whose bottom branches had been cut away to a height equalling their spread outwards from the trunk, which was not watered round the stem of the tree—and on the collar of which the sun could shine at morning or afternoon—that perished from root-rot, I am prepared to admit that root-rot is my master, and I know nothing whatever of the cause of the "disease."

On the other hand, if any grower now suffering, whose trees are not actually dead, but which have, on one side or the other of them, one inch of sound bark upwards from the collar, I say, if he will cut away the bottom branches in an intelligent manner to a height equal to their length, using neither chemicals nor antiseptics, but allow the sun only to effect the cure; he will not only cure root-rot, but will have the satisfaction of proving the originating causes, namely shade and moisture.

When the wounds have dried up, daub thick white-lead paint over the exposed *wood*, to keep the *wood* from decay.

POULTRY FOR PROFIT.

Moisture Incubators.

CHAPTER III.

Moisture incubators, are those into which a certain amount of moisture is artificially introduced through the egg chamber. In this chapter I shall try to describe briefly the advantages these machines are supposed to have over dry air or non-moisture machines.

The moisture machine is slightly different in construction to the dry air machine, in that it has a tank made of copper or iron (usually copper) directly above the egg chamber, and also wet cloths or drawers of wet sand under the egg tray. One of the best if not the best of this type of machine is the Hearson. This machine is as above described, viz., water tank over the eggs and drawer with wet cloths under same. This machine relies on what is called a capsule for regulating the heat of the egg chamber. This capsule consists of two small square pieces of metal hermetically sealed, (with alcohol or other liquid between the two). The idea is that when this liquid expands with the heat (as all liquids do more or less) the sides of the capsule are expanded and this acts on a rod which holds a damper over the heating apparatus. All volatile liquids boil at a certain temperature, and this temperature is of course called the boiling point of that liquid. The following table will perhaps make this quite clear.

Water boils at	...	...	212° Fahr.
Alcohol „ „	...	...	173° „
Bisulphide of carbon	...	...	118° „
Ether	...	...	94° „

You will easily see that if any of the abovementioned liquids are enclosed in a capsule as previously described, this capsule will be distended or expanded as soon as the boiling point is reached.

To continue the description of the Hearson machine, its outward appearance resembles a handsome square cabinet, the upper half of this box or cabinet contains the tank for the water previously mentioned. Through this tank a flue runs which consequently heats the water. The lamp fits in a square sheet iron box screwed to the side of the incubator itself, on the top of this a flue which is covered by a damper. This damper is automatically raised or lowered by the expansion or contraction of the metal capsule. I have tried to get an illustration of this machine to make the description more lucid, but was unable to get one in town. I have known equally good results from both types of machines, but there are certain climates which do require applied moisture for the

successful hatching of chicks and especially ducks. In high altitudes especially, the moisture machine is the best unless your dry air incubator is fitted with a moisture device. I saw one of these moisture devices working on a Cyphers incubator (dry air) a few days ago and was told it worked admirably. In my opinion the tank, or moisture machine is not a necessity. Both types of machines work well and with the dry air machine you have only the thermometer to look after whereas in the moisture machine you have two. Besides in most of these moisture machines, any that I have seen have no provision made for the removal of the chicks from the egg chamber without opening the door or drawer. This is a serious disadvantage, whereas in the Cyphers dry air machine the chicks automatically find their way into a chamber below the egg trays and remain there until the hatch is over. It is absolutely necessary to retain as much moisture (which is contained in the eggs themselves) as possible during the hatching period. With the permission of the Editor I intend to write a chapter on Brooders, Housing, Feeding Diseases, and general management. I have dealt with several letters this month and would like to have more enquiries from readers on any points that I have not made sufficiently clear, as these chapters are intended to be a help to those starting poultry-keeping and perhaps a little advice to those who have already started.

Next month "Brooders and how to work them."

REPLY TO "A PRACTICAL CRITIC".

Mr. J. Martin in your last issue writes he must take exception to many of the points raised by me in my previous chapter. The many points raised are two. Number one is an error and should read "secret" not "science" I am glad he pointed this out. Number two is easily answered. I said that of course farmers could not always command 16s. or 21s. a dozen for eggs but that they could sometimes. I am sorry he cannot believe that fowls can be made to pay. Later on in his letter he says when he attended to them himself they did pay. Perhaps Mr. Martin will be good enough to let us know what he does know concerning making poultry pay. It will be helpful perhaps to readers. Can he tell me why and by whom utility poultry keeping is being kept in the background? The laying contest at Rosebank shews this is not the case but quite the reverse, as the Western Province Agricultural Society are conducting this competition and doing all in their power to promote utility breeding, and may success attend their efforts! The idea of these chapters is to promote an interest in the poultry raising industry and help those who are beginning.

I have to thank Mr. Martin for pointing out the error due no doubt to writing not being sufficiently clear.

SHAMROCK.

'RUSSIAN THISTLE" or "SALTWORT.

(*Salsola kali*, Linn.)

By DR. E. A. NOBBS, Agricultural Assistant.

Attention has been called by Mr. T. G. Theophilus, of Barroo, residing in the Karoo parts of Uitenhage District, to a weed unknown previously to him, and which he considered to be spreading and likely to become a pest. Thanks are due to him for his timely notice as this plant has been identified by Miss Treleaven as the "Saltwort" (*Salsola kali*) "The Russian Thistle" of the Americans, a weed known in the Colony for many years, but not hitherto considered harmful. In the United States however, it is a very serious pest in some regions, and it is stated officially that in one year alone it occasioned the loss of some two million dollars.

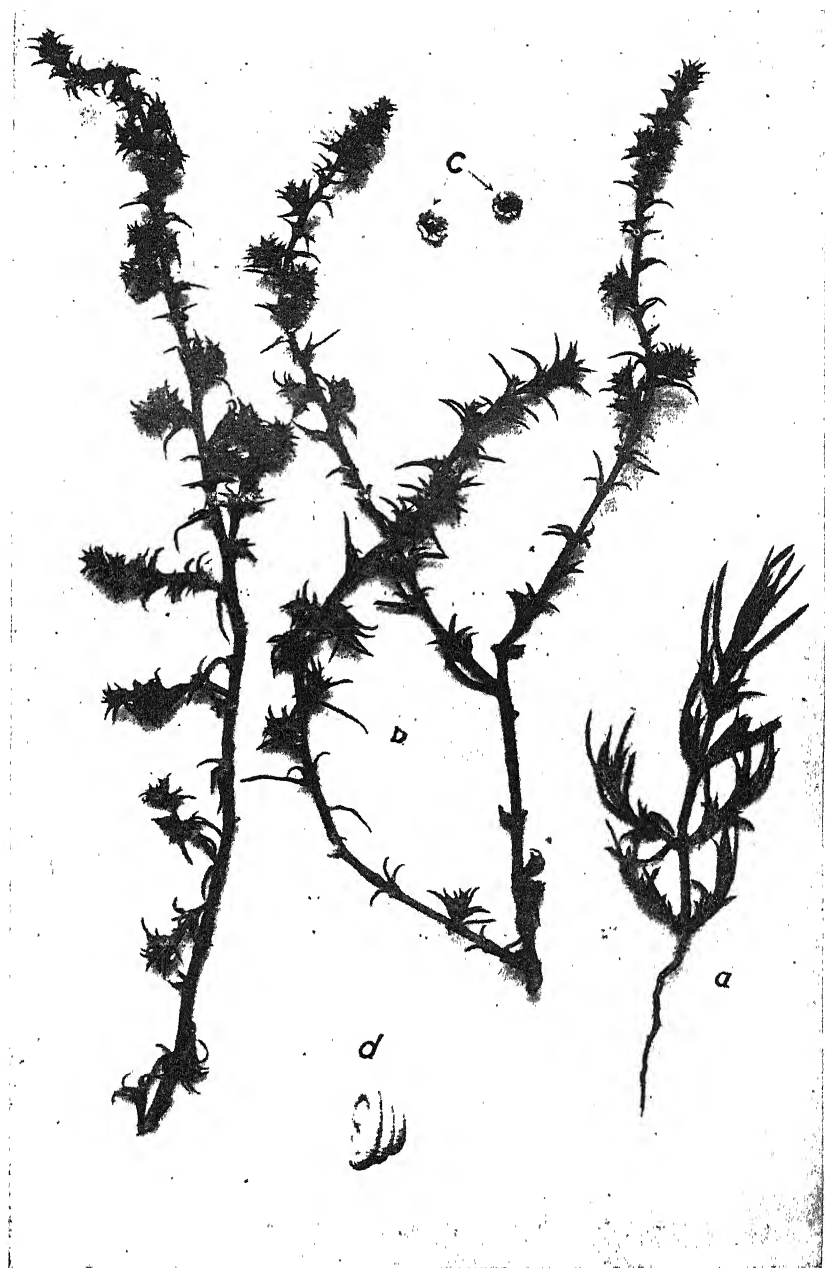
The chief injury seems to be to Lucerne and corn lands, while the thorns hurt horses and other animals. It has not been reported to do harm to wool or hair. The attention of Divisional Councils and farmers generally may be called to this plant (illustration herewith) and where it is known to exist it might be well to have it proclaimed a noxious weed, as "a stitch in time saves nine."

The "Saltwort" is a free seeding annual. Mr. L. H. Dewey, Botanist to the United States of America Agricultural Department, describes the plant as follows:—

"When young, it is tender and juicy throughout, with small narrow, downy green leaves, but in late summer it sends out hard stiff branches which bear, in place of leaves, sharp spines, one-fourth to one-half inch long. At the base of each cluster of spines is a papery flower about one-eighth inch in diameter.

"The Russian Thistle takes possession of a field to the exclusion of everything else, drawing from the land a large amount of nourishment. It is armed with spines quite as sharp as those of the Canada Thistle and much stronger, so that in some sections the farmers find it necessary to bind leather about the horses' legs while at work."

From the same report we gather that the best method of extirpation is ploughing under while young and soft, and before seeding, collecting and burning older plants or plants growing along fences, sluits or roadsides. Sheep are said to eat it down readily while young, which gives ground for hope that it may be kept down in unenclosed lands where sheep run.



"Russian Thistle" or Saltwort, (*Salsola kali*, Linn.)
 (a) Young plant (b) Mature plant in flower. (c) Flowers. (d) Fruit. a. b.
 and c. are reduced to two thirds natural size; d. is much magnified.

WESTERN PROVINCE AGRICULTURAL SOCIETY.

EGG-LAYING COMPETITION AT ROSEBANK.

RECORD OF EGGS LAID DURING FIVE WEEKS ENDED 22ND JULY, 1906.

Pen No	Variety.	Pullet No.	Eggs laid.	Points.
1	Buff Orpingtons	1	4	8 (died 25/6/06)
		4	14	28
2	Partridge Wyandottes ..	5	5	10
3	White Wyandottes ..	9	18	35
		10	21	42
		11	16	27
		12	2	2
4	White Leghorns ..	13	20	36
		14	15	18
		15	5	6
		16	13	22
5	White Wyandottes ..	18	2	2
		19	12	24
		20	6	11
6	Buff Orpingtons ..	21	8	16
		22	10	20 (died)
		23	20	40
		24	12	24
7	Plymouth Rocks ..	25	15	30
		26	9	10
		27	19	36
		28	11	16
8	Buff Orpingtons ..	29	19	34
9	Brown Leghorns ..	33	12	24
		34	1	2 (died)
		35	23	46
		36	13	26
10	Buff Orpingtons ..	37	3	6
		38	9	17
		40	7	14
11	White Leghorns ..	41	14	28
		42	4	8
12	Buff Leghorns ..	45	7	9
		46	8	15
		47	8	14
13	Buff Orpingtons ..	49	19	38
		50	20	39
		51	11	22
		52	18	30
14	Buff Orpingtons ..	53	15	29
		54	18	32
		55	10	20
		56	15	27
15	White Wyandottes ..	58	16	32
		59	5	10
16	Black Orpingtons ..	61	11	22
		62	15	30
		63	16	32
		64	21	41
17	Buff Orpingtons ..	68	10	20
18	White Leghorns ..	70	14	16
		71	13	26
		72	16	26
19	Brown Leghorns ..	73	18	26
		74	2	2
		75	15	16
		76	3	4
20	White Leghorns ..	77	10	20
		78	11	21
22	Buff Orpingtons ..	95	3	4
		86	11	22
		87	5	9
		88	8	13
23	Buff Orpingtons ..	89	13	26
		92	14	28

Those pullets not mentioned have not yet commenced to lay.
In scoring, two points are given for every egg weighing over 1½ oz., and one point for every egg weighing 1½ oz. or less.

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith. A *nom de plume* may be attached for publication.

Experimental Crops—Rape and Buckwheat.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In the last issue of the *Journal* appear some reports on experimental crops. I would like to say that we here have long known rape to be one of the best feeds for cattle, sheep and pigs. To grow to perfection it requires good soil and rainfall, or irrigation, but will sometimes pay under other conditions. I am of opinion that there is no plant that will give equal results, pound for pound, for milk and flesh production, not even excepting lucerne. I am not alluding to weight per acre or other points of comparison. I was surprised to see that, with the exception of three, all those who reported on buckwheat sowed in winter. And these three were naturally the only ones that gave anything like a favourable report. Some time ago I wrote recommending this crop, but only under certain conditions. I then stated that it would not stand frost, drought, or hail. I did not put it forward as a substitute for wheat, oats and barley, but mentioned that its principal value lay in its yielding a crop of grain in a remarkably short time. After a long winter drought, when wheat, etc., have totally failed, and the first rains fall about December, too late on the high veld for any other grain crop to ripen before the frosts, then buckwheat comes in handy as giving a yield of grain useful for human food, as well as some animals and poultry. As a rule, in the above kind of season, a lot of rain falls from January to April, and buckwheat will thrive and ripen within three months from date of sowing. After Christmas hail rarely does much damage. My experience of this crop is confined to this district only. If I could grow a crop of other sorts of grain I would not sow buckwheat, because it would not be worth doing, but in times of scarcity any grain is valuable. It is particularly suited to the poor agriculturist.—I am, etc.,

CUTHBERT A. POPE.

Molteno, 13 July, 1906.

Thriving Pines in the Bedford District.

To The Editor, AGRICULTURAL JOURNAL.

SIR,—I am sending you by post three cones of a pine that is growing here, so as to name it. This pine seems to thrive very well in our dry climate. Some of the oldest trees are 57 years old, and have attained a height of about 80 feet, and seem in good health, and are still growing. They grow much faster than the pine that is commonly grown about Cape Town, but the branches are very apt to be broken off with some of our high winds. I had a number of the pines that are grown on the Cape Peninsula,

varying in age from 30 to 40 years. They have nearly all succumbed to our dry season. Some of them had attained to the height of 40 to 50 feet. Not one of the variety of which I am sending you the cones has died, and it would be well if our nurserymen grew this pine for our Midland districts, as it makes a handsome tree. But its great recommendation is that it does not seem to require the winter rains, and thrives in our dry climate. Some of the seeds of this pine were sent down to the Forest Department, King William's Town, and they name it the Aleppo Pine. I find that on other farms farmers have had the same experience *re* their pines.—Yours, &c.,

R. H. PRINGLE.

Lynedoch, June 17.

The cones for identification are those of the Aleppo Pine, the botanical name of which is *Pinus halepensis*. It is also known to some farmers as the Jerusalem Pine. This pine has been recommended for some years by the Forest Department for planting in the upland districts with a summer rainfall, and is known to give the greatest satisfaction. It is largely propagated at the Fort Cunyngham Plantation and at Tokai by the Forest Department, and farmers desirous of obtaining these trees may get them in the form of seeds or transplants on application. The *Pinus canariensis* or Canary Pine is an equally hardy tree, and resists drought as well as the Aleppo, consequently it is also suitable for planting in the uplands of the Eastern and Midland districts. The *Canariensis* has this advantage that its timber is more valuable. The tree described as that grown in the Cape Peninsula is the Cluster Pine or *Pinus pinaster*.

Water Finding by the Divining Rod.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Is there any means by which we can arrive at a definite conclusion *re* the working of the divining rod? Many men are positively certain that by its means they can locate water; some men assert that minerals can be indicated; others profess to be able to tell at what depth water will be found and its quantity. I am one of the few who are sceptical about the matter. I do not see how it is possible for anyone being affected by water when it is 50 to 300 feet below the surface, and then to profess to be able to tell the depth at which the water is likely to be found and its quantity. I acknowledge that many of these men are honest men and will work with the divining rod just to shew their neighbours where they think water is to be found. They charge nothing for their trouble. There are others who are frauds and making money out of those who are willing to employ them. I will acknowledge that in some instances people have got water in what I would call very unlikely localities by boring where the divining rod indicated. But I know of many instances where it has been an utter failure. I know of one instance in this district where four (at least) waterfinders indicated that the rod worked. The unfortunate farmer bored down 350 feet, but found nothing. And I know of others who have bored on localities where the rod did not work and found water at no very great depth. The mystery is why does the stick work? In some hands a bit of fencing wire will work. Other diviners say they can feel the sensation if they are riding in a cart or on horseback. I have come across men who say the divining rod will work with them anywhere and the forked stick will twist off in their hands. Many of these honest men have heard that when the rod works it indicates water and they believe it, and some say that the rod will only work when the water is moving. It will not work over a closed pipe, but as soon as the tap is opened and the water begins to flow the rod will begin to move. What causes the rod to work is a mystery we want explained. But when men profess to tell you the depth and quantity of water and say the rod will only work over running water, I lose all faith in them.

Hoping your department will be able to throw some light on the subject,

Yours, &c.,

R. H. PRINGLE.

Lynedoch, June 17.

The mysteries of the divining rod have yet to be explained. Though several theories have been put forward none have been accepted as final. The uncertainties mentioned by our correspondent tend to make the subject most difficult of explanation.

Swiss Milk Goats in South Africa.

To the Editor, AGRICULTURAL JOURNAL

SIR,—In your June issue Mr. H. Alston enquires for Swiss goats, and seeing that there was no reply to his enquiry in your July number, just to hand, I should like to tell him what I know of this wonderful goat.

Some two years ago, Mr. Walter Rubidge, M.L.A., for Vryburg, imported about forty-eight of these goats, ewes and rams. A Mr. Read of this town was fortunate enough in inducing Mr. Rubidge to let him have two ewes and a ram. One of the ewes died about eight months after giving birth to a ram kid. The remaining ewe has also kidded, and a Mr. Bowker, manager of Mr. Henry Steytler's estate at Lawley Station, about seven miles out, who bought the lot from Mr. Read, tells me that this ewe has been giving five bottles of milk per day for some months past, and that it was necessary to milk her three times during the day.

I understand that when Mr. Rubidge bought his goats in Switzerland they were all guaranteed, and actually did give, ten bottles milk per day per goat. The change of climate and pasture has thus reduced the yield by exactly one half.

I believe that the cost of these goats at the Coast is about £9 each.

It would appear that Mr. Alston possesses boer goats of a good milking strain. If he can buy a ram from Mr. Rubidge to cross with his boer goats, the progeny from such a cross would be most valuable and should produce at least from two to three bottles milk per day.

Having secured one of the abovementioned rams from Mr. Steytler, I purpose crossing with a good stamp of boer goat, and feel sure that the result will be satisfactory. I shall be very pleased to publish the result of my experiment in your valuable *Journal*, say two years hence.—Yours, &c.,

C. R. GARDNER.

Johannesburg, July 10.

The Culture of Chicory.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I was very much interested in the article on The Culture of Chicory in the last *Agricultural Journal*. Will you give us some more information? We can grow thousands of tons of Chicory root along our Coast, as it is there is a good bit grown every year. The Firm we used to supply in Port Elizabeth would not take any more roots a few years ago; I see they are taking a limited quantity again but have reduced the price from 21s. to 15s. per 100 lbs. dried. The Firm takes it cut up in small pieces and sun-dried. The drying part is the greatest trouble as it rots very quickly if you happen to get damp weather for a few days running. Further information as regards drying the roots and so forth will be very welcome, also how many Factories are there in the Colony.—Yours, etc.,

G. R. VAN ROOYEN.

Alexandria, June 25th.

Experience has shewn that, as the correspondent says, there is great difficulty in drying this product in the ordinary way. Moreover the sundried article is much inferior to the kiln dried. Farmers are therefore strongly recommended to send the fresh roots direct to the manufacturers. Chicory roots are carried on the Cape Government Railways under Class C. viz., at 4d. per ton per mile plus 1s. 8d. per ton terminals. If they have been allowed to sweat in a heap previous to being trucked either loose or in bags they will keep well for several weeks but it is a great mistake to dig them up, bag them and send them off at once. The only manufacturer we know of is Mr. S. Salaman, Cape Chicory Works, King William's Town, and a price often paid in the past has been £2 10s. per ton for fresh roots delivered there. No doubt if the cultivation of this crop became considerable in any district, factories would be established in the locality.

Mineral Manures.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I shall be glad if a Government chemist will kindly answer some queries which arise from a perusal of the article on Extra-Tropical Forestry in the June number of the *Agricultural Journal*.

(1) On page 783 Dr. Hahn advises the mixing of wood ashes with farm-yard manure. Most books say that this mixing should be avoided, as it causes loss of ammonia. Which is correct?

(2) On page 773 Dr. Hahn advises the burning of bones. On page 774 burning is said by Californian experts to be an unqualified detriment to bones. Which is correct?

(3) On page 775 the Transvaal chemist says that phosphoric acid applied to soil in soluble form rapidly becomes insoluble. Why then apply basic slag and bone meal in autumn when roots are dormant? How can plants absorb insoluble material, as it is stated on page 774 that they do?

(4) Bones appear to contain about 50 per cent. phosphate of lime, but only about 4 per cent. carbonate of lime. Is not the lime in the phosphate available? On page 777 it is said that it is available. Why then is bone ash not so suitable as basic slag on soils not containing lime?—Yours, &c.,

ENQUIRING MIND.

Stellenbosch, June, 1906.

This letter was referred to the Senior Government Analyst, who kindly furnished the following reply:—

THE TREATMENT OF CHEMICAL MANURES.

To the Editor, AGRICULTURAL JOURNAL.

SIR.—The questions of your correspondent "Enquiring Mind" need, for full answer, rather more space than you would feel probably disposed to give them, I shall however, as far as I am able, endeavour to deal with them briefly, remembering at the same time how difficult it is to explain statements that have been made not by one's self but by others.

(1) On page 783 Dr. Hahn does, it is true, advise mixing ashes with farm yard manure, and it is also correct that, theoretically at least, such mixing may, under certain conditions, involve loss of ammonia, but in this connection one needs often to come down from broad generalities to detail. In the first place, the quantity of ammonia actually lost may in practice be very small, depending entirely on the nature and condition of the ashes and the proportion added: the setting free of ammonia from the nitrogenous compounds of the manure may be so slow a process that there is no time for a substantial loss before the manure is applied to its intended purpose. Furthermore, if the manure is moist, some of this evolved ammonia may be retained by the particles of water. Next the farm-yard manure may be so rich in nitrogenous constituents that the loss of a small amount would be more than compensated for by the addition of potash, especially in the case of a soil which needs the latter. Moreover, your correspondent will see that Professor Hahn recommended the addition of ashes as an aid in the nitrification of the manurial nitrogenous compounds. What is here meant is that where the quicker action produced by nitrification is so valuable, it can safely be promoted even though in the process some of the nitrogen is lost: a cut diamond is more valuable than it was before the operation; it has lost in weight, true enough, but it has been so changed that the part is worth much more than the whole was previously.

Everything depends on whether you need nitrogen or potash, and whether you need nitrogen in the most readily available form or not.

(2) A somewhat similar position is here involved. I scarcely need to answer the question at length, as, to a certain extent, Dr. Hahn himself deals with it in the very paragraph from which your correspondent takes his quotation. The Californian advice is not to burn bones, and so lose nitrogen. Dr. Hahn admits just above that such a process does mean a loss of nitrogen, but it means at the same time a gain of soluble phosphoric oxide, which is probably worth far more than the nitrogen that has been dissipated. Very often it is a much more important matter to get the phosphoric oxide soluble than to retain the nitrogen, and a though the former object may be

secured, without detriment to the nitrogen, by means of sulphuric acid, where that agent is cheap and easily procurable, in this Colony it was neither cheap nor easily procurable at the time Dr. Hahn's remarks were penned, eighteen years ago, nor is it yet practicable.

Even without sulphuric acid, it is for farmers at least much easier to reduce burnt than unburnt bones to a fine powder, and where phosphates in a finely-divided condition are the great desideratum, it may be worth while sacrificing even the nitrogen so as to attain this end.

(3) It is perfectly correct to say that phosphoric oxide, when applied to soils in a soluble form, rapidly becomes insoluble, but when we use the term "insoluble" we have a particular solvent in mind. We speak, for instance, in connection with chemical manipulations, of water-soluble and of citrate-soluble phosphoric oxide, and look upon the former as more valuable than the latter, but neither of these expresses exactly the solubility of the phosphatic material in the liquid, through the medium of which entrance to the plant rootlets is effected, and even this liquid varies greatly in solvent capacity according to the plant concerned. The subject of the solubility of plant food substances in soil water is one on which science has not yet said its last word, and when we speak of insoluble phosphoric oxide we do not imply that substances which appear perfectly insoluble when treated with certain reagents in the chemists test glasses are equally insoluble under the differing conditions which obtain in the soil, and least of all can we arbitrarily label as "insoluble" such substances as basic slag or bone meal when reduced to an impalpable powder, even although they may be almost wholly insoluble in water and largely so in citrate solution. Insoluble substances become through time soluble by processes of fermentation.

(4) Lime compounds exist in the bones chiefly as the phosphate; only to a small extent as the carbonate. Assuming for the moment that the phosphate of lime is not available, then, unless some chemical reaction can take place to break up the phosphate of lime, it follows of necessity that the lime cannot be available either, since phosphate of lime is a definite chemical compound, so that the lime cannot enter into the plant system leaving the phosphoric oxide outside. It is true that in some way, the details whereof are not yet fully known, the plant itself may set such a chemical reaction going, and thus for all practical purposes remove from chemical combination perhaps only the basic part of a salt, but it is hardly likely that such a consideration would apply when the plant greatly needs both the base and the acid, as is often the case with lime phosphates in poor soils. If, on the other hand, the phosphate of lime is in an available form, then the whole is available, *i.e.*, both the lime and the phosphoric oxide. Here, however, it is again possible that both may not be required, and so scope must be allowed for the selective capacity of the plant. The reactions that go on in the soil under such conditions are so various and complicated that we cannot fetter them by so many definite chemical equations. We should also remember that "available" and "soluble" are terms which are not limited by hard and fast boundaries; both depend upon and are affected by various conditions, such as the mechanical condition of the soil and of the fertiliser itself, the presence of other chemical compounds in the soil, and the nature of the crop.

CHAS. F. JURITZ,

Senior Analyst.

Ostrich Eggs and Frosts.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Could you kindly inform me if any harm will come to ostrich eggs from being in the veld during a severe frost? We had 11 degrees Fahrenheit here on the 13th, and I wondered if it would weaken or kill the embryo.—Yours, &c ,

B.W.

Middelburg, July 17.

We have no definite information on the subject, but the opinion is expressed that such a depth of cold would not materially affect the embryo. If our correspondent incubates the eggs, the result would be worth noting as an actual experience.

Incubating.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—My experience with using incubators, is that they are worse than the nightmare for work and trouble, let alone the expense of running them.

Eight years ago I ran a good English make two-hatches. First 100 fowls' eggs, hatch 25 chicks; second 100 eggs, 29 chicks from untasted eggs. Cost for paraffine 21 days, incubator, and 35 days brooder, 18s. 8d. per hatch.

Three years ago I tried an American make, with outside arrangement of mercury to regulate damper. Result from three hatches of 100 eggs untasted, 99 chicks. Cost for paraffin 21 days incubator and 30 days brooder 12s. 9d. per hatch (oil cheaper).

The difficulty I found was that the night temperature of the room used to go down sometimes as much as 15 degrees, and the incubator running at 101 at six in the evening, would be 95 to 97 in the morning. Then, during the day, unless attended to as the day go hotter, would go up to 103 to 105.

My advice is to hatch chickens under hens, and rear in a brooder, as they thrive splendidly in the same (even if home-made out of a case).—Yours, &c.,

ANTI-INCUBATOR.

Cofimvaba, June, 1906.

Destructive Sparrows and Finches.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Perhaps you or some of the readers of the *Agricultural Journal* may be able to inform me how I could poison or kill by some other means, sparrows and finches which abound here in hundreds, and not only do a great deal of damage to my crops but also destroy my grapes and other fruit every year. I have previously tried to poison them with grain (wheat) soaked in arsenic dissolved in water, and a little sugar sprinkled over it after having taken it out of the water. Now I have tried it again. But the birds won't touch it. Whether it is on account of the veld being so good just at present I cannot say. Should you be able to inform me of a means whereby I could kill these birds, you will not only do me a great favour but the whole district, as I am quite sure the loss to the farmers by these birds, amounts to a lot of money every year.

Thanking you in anticipation.—Yours, etc.,

FARMER.

Richmond.

Poison baits and traps are the only methods we know of. The one has evidently proved ineffective owing to the amount of food about. Traps might be tried.

The "Cancer Bush" as Stock Food.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Since residing here, now more than three years, I have noticed a certain plant which grows here and of which stock are very fond.

The plant is in size about the same as Worm-wood (*Wilde Als*).

The good points in this plant which particularly struck me are the following:—

- (1) Stock, especially cattle and goats, are very fond of it.
- (2) The seed germinates easily.
- (3) The plants grow in one year from two to three feet high.
- (4) It is very much drought resisting.
- (5) During the winter it is green and yields a good amount of feeding.
- (6) During the great drought I have seen this plant grow and blossom in dry hard ground; whereas all grass and other plants round about it were dead.

From the middle of July till the end of August it is in blossom. Simply covered with red blossoms and a pretty sight to see. I have sown some of the seed in November last year; these plants are now about 36 inches high. I am sending you

one of them. Could you kindly inform us what plant it is and your opinion about it?

It seems to me to be just the plant for South Africa and that we ought to cultivate same.—Yours, etc.,

GID. F. JOUBERT.

Welbedacht, Lady Grey, A.N. July 11th. 1906.

The plant submitted is identified by Miss Treleaven, of the Government Herbarium, as *Sutherlandia frutescens*, R. Br. It is known as the "Cancer-bush," a fine showy plant found all over the Colony, and on account of its beautiful scarlet flowers, is much cultivated in our gardens. It is used by colonists as a tonic, in Stomach disorders, and is said to have cured malignant tumours cancerous in appearance, which non-professional persons have believed to be cancers; hence its name. Thunberg, in his Travels, says that the roots and leaves of this plant, when dried and pulverized, are of use in diseases of the eye. We can get no information as to its value as a fodder plant.

Destruction of the Veld by Field Rats.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I would like to use your paper as a medium for drawing attention to the wholesale destruction of the veld, in many parts, by field rats.

In this district they seem to be specially bad. In some parts the veld is absolutely destitute of vegetation, caused by this pest.

I shall be glad if you can suggest any means for destroying them. I have thought of steeping mealies in arsenic, and killing them in this way, but had to give up the idea, as ostriches are so liable to pick up the poisoned mealies.

Thanking you in anticipation.—Yours, &c..

J. F. BUCKLEY.

Steytlerville, July 10.

We fear we cannot suggest anything very original. The only methods that can be relied upon are first, poisoned baits. This, our correspondent states, is impracticable in his case, as ostriches pick up the poison. The other alternative is the large American trap, and this, to be effective, needs to be handled with skill. Some of our readers who have practical knowledge of this subject may be able to offer suggestions out of their experience.

Rat Extermination.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I exterminated rats from my shop and store by putting down mealies soaked in strychnine and water for two days, and using a spoon for putting the poisoned grain down. This scared them off for five years.—Yours, &c.,

ROUGH ON RATS.

Cofimvaba, June, 1906.

Bees.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Will one of your readers recommend a good all-round work on bee-keeping?

I find that the only way to keep swarms in the hive is to have the entrance of queen excluder zinc. The wild swarms I get are taken from holes in anthraps, and one I got on Saturday has swarmed seven times in five days, but returns to the hive, as the queen cannot follow. I use Hoffman frames and section supers, but have only just started, and could not keep swarms before using zinc.—Yours, &c.,

BEE-KEEPER.

Cheshire's "Bees and Bee-keeping" (two vols.), Cowan's "Book on Bees," and the "Bee-keepers' Guide," by A. J. Cook, are all good works on the subject. The "A B C of Bee Culture," by A. and I. Root, is one of the latest.

RURAL REPORTS.

For the month ending 15th July, 1906.

Barkly West.—Condition of veld good, except where it is not overstocked or destroyed by locusts. Rainfall light. Stock generally in good condition.

Bedford.—Veld in excellent condition for this time of the year, grass plentiful and karoö quite green. Rainfall light. Stock generally in very good condition.

Ceres.—Average rainfall. Weather in Ward No. 1 has been very mild; in Ward No. 3 cold. Condition of veld promising. Vines suffering somewhat from phylloxera. American grafted stocks have grown fairly well last season. Cereals in good condition. Stock generally in fairly good condition.

King William's Town.—Around Middledrift a fair amount of rain has fallen. The veld, however, is very withered. Oranges, naartjes, figs, peaches, quinces, and apricots are grown here, and do well. Fruit fly very conspicuous among the peaches and apricots last year, causing the crop to be an entire failure. Grain is grown to perfection. Stock generally in good condition.

Laingsburg.—The rainfall during the month has been light but slightly better than the previous season, and the weather has been cold. Condition of veld good. Wheat and oats doing well. Stock generally in good condition.

Molteno.—Rainfall nil. Weather good. Condition of veld dry. No grain or lucerne in this district. Horses and sheep in good condition, the same remark applying to the few pigs that are in the district.

Oudtshoorn.—Veld in splendid condition and rainfall plentiful. Lucerne not doing quite so well as usual. Harvesting mostly over. Stock generally in good condition.

Philipstown.—The weather is cold and the condition of the veld is very bad. There is very little grain and lucerne. The peaches are being destroyed by insects. Stock generally in poor condition.

Robertson.—Weather rather cold, and the condition of the veld is getting better every day. Rainfall average. Some of the vines have been injured by Phylloxera. Wheats and oats are not grown to any large extent, but a good deal of barley is sown. Lucerne growing slowly in winter. Stock generally in fair condition.

THE TRANSKEI.

For the month ending 30th June, 1906.

Cofimvaba.—Mealie and kafir corn crops have all been reaped, the former may be considered a fair crop generally, though indifferent only in some parts of the district; on the other hand, the latter have yielded small all over the district. No fresh outbreak of diseases amongst cattle has been reported during the past month, there are, however, 11 areas under quarantine for redwater, which will probably be released during this month. All other stock are in good condition.

Flagstaff.—During the early part of the month the weather was warm, since the 23rd, however, high winds, with occasional showers, have prevailed, and in consequence, it has been bitterly cold. The rainfall was about half an inch. The veld is good, and stock, both large and small, are in good condition. No disease was reported.

Kentani.—There is nothing special to report. All agricultural pursuits are now at a standstill. Nice rains have fallen during the month, and the pasturage is in good order.

Lusikisiki.—The weather here is mild and the veld in very fair condition. There was one heavy shower during the earlier part of the month. The condition of the mealies and kafir corn is poor. Stock generally in fair condition.

Matatiele.—The month of June like its predecessor was exceptionally dry. The temperature, however, was much lower than that of May and several sharp frosts were experienced. In consequence the veld has a very withered and parched appearance but taking it all round, stock, both large and small are in remarkably good condition. The harvest, which has now been gathered, is above the average for the past three years, and natives have abundance of surplus grain for disposal.

Mount Frere.—The weather has been variable during the month, mostly warm. Last week there were high winds. These were followed by very welcome and acceptable showers of rain, with snow on the mountains, which have laid the dust. The veld has a wintry appearance and dry on the highlands, but still with a green tinge on the slopes of the hills and the valley. Stock is in fair condition, though not as good as usual when running in the old lands, which in consequence of the drought in the summer and autumn, and the Mabele Aphis have not been such good feeding. There has been a recrudescence of scab, attributed to the introduction of sheep from other parts, and the fact that during the last simultaneous dipping the natives did not always bring all the sheep in their flocks to be dipped, the ewes in some cases being unable to travel being heavy with lamb and lambing. Dipping in May is too late and causes much dissatisfaction and loss to stock-owners. Three fresh outbreaks of lung-sickness have been reported during the month, one occurred in cattle introduced from the Mount Currie District and the other two in transport oxen, recently arrived from East London. All our worse cattle diseases and ticks come from the ports and it will be a great day for the country when Railways are running through it and waggon transport from the Ports is no longer necessary.

Port St. Johns.—Veld in fair condition. Weather very changeable, cold North East winds have been blowing frequently. Rainfall very light. Orange crop is affected by disease and is a total failure. Fair crops of mealies and kafir corn but not as abundant as anticipated. Horses in fair condition.

Tabankulu.—June was cold and dry, only about half an inch of rain falling and a little snow. Stock maintained their previous condition. No fresh cases of disease have been reported.

Umtata.—There is no matter of interest to report for the past month. Being mid-winter no agricultural pursuits are in progress. Pasture is scant and stock in poor condition. Lung-sickness has broken out in the District and contacts inoculated so that the outbreak is not likely to spread beyond the limits of the quarantined area. The quarantining of infected areas is, however, a hopeless task, as Natives generally act in these matters with the utmost apathy. There are no Police available to enforce and successfully prosecute under the Act and the Headmen do not as a rule shew sufficient interest. Territorial cattle, especially in this locality, however, appear to be generally immune from both Redwater and Lung-sickness and it obtains little hold.

Willowvale.—Condition of veld poor. Weather bright and windy. Very small rainfall. Not much fruit in district, trees having been attacked by moth pest early in season. Good crop of mealies and kafir corn. Stock in fair condition.

NOTES ON THE WEATHER OF JUNE, 1906.

By CHARLES M. STEWART, B.Sc., Secretary to the Meteorological Commission.

Exceptionally low barometric pressure, unusually mild weather for the month, although accompanied by daily, and occasionally severe, frosts, a high percentage of cloud with a comparative absence of fogs, and a practically normal depth of rainfall were the leading features of the weather of June.

Precipitation.—The mean rainfall for June, as shown by records from 305 rain-gauges, amounted to 1·49 ins., falling on five days, being only 0·01 ins. or less than one per cent. under the average. The table given below shows that, although rainfall was most abundant over the Cape Peninsula, the month was relatively dry there, being 21

Division.	Mean Rainfall (1906).	Mean No. of Days.	Average Rainfall (1891-1900).	Average No. of Days.	Actual Differences from Aver- ages.	Percentage Differences from Aver- ages.
	Inches.		Inches.		Inches.	Per cent.
Cape Peninsula ..	4·62	13	5·84	13	— 1·22	— 21
South-West ..	3·54	9	3·48	8	+ 0·06	+ 2
West Coast ..	2·74	8	1·44	6	+ 1·34	+ 93
South Coast ..	1·58	6	2·18	6	— 0·60	— 28
Southern Karoo ..	1·47	4	0·90	3	+ 0·57	+ 63
West Central Karoo ..	0·62	4	0·54	2	+ 0·08	+ 15
East Central Karoo ..	0·38	3	0·42	2	— 0·04	— 10
Northern Karoo ..	0·54	3	0·62	2	— 0·03	— 13
Northern Border ..	0·03	1	0·42	1	— 0·34	— 81
South-East ..	1·15	4	1·03	1	+ 0·12	+ 12
North-East ..	0·38	3	0·88	3	— 0·50	— 57
Kaffraria ..	0·41	2	0·79	2	— 0·38	— 48
Basutoland ..	0·19	2	0·98	2	— 0·79	— 81
Orange River Colony ..	..	..	0·70	2	..	..
Durban (Natal) ..	1·02	3	0·94	..	+ 0·08	+ 9
Bechuanaland ..	0·00	0	0·39	1	— 0·39	— 100
Rhodesia ..	0·01	1	0·14	1	— 0·13	— 93

per cent. less than the ten years' average. A similar deficiency in the amount of precipitation for the month prevailed over the South Coast, the East Central and Northern Karoos, the Northern Border, the North East, Kaffraria, Basutoland, Bechuanaland and Rhodesia,—the deficit being least, 10 per cent., over the East Central Karoo, while absolute drought was experienced at all our stations in Bechuanaland. An excess of rainfall was met with over the South West, West Coast, Southern Karoo, West Central Karoo, and South East Divisions, and apparently also in Natal, as shewn by the record at Durban,—the surplus being greatest (93 per cent.), over the West Coast and least, (2 per cent.), over the South West. Compared with the previous month, there was a continued excess of rainfall over the normal, over the Southern and the West Central Karoos, the South-East, and at Durban, and a continued deficit over the Cape Peninsula, Basutoland, Bechuanaland and Rhodesia. On the other hand while the deficits of May over the South-West and West coast Divisions have been converted into surpluses the reverse has obtained over the South

Coast, the East Central and Northern Karoos, the Northern Border, the North East and Kaffraria. As far as the actual quantities recorded are concerned, there has been a decrease over all divisions, except the Cape Peninsula, the South West and the West Coast. On scrutinising the individual returns it is found that out of the total of 305 stations, absolute drought was experienced at only 17 stations, although no fewer than 152 or almost 50 per cent., had totals for the month ranging from 0·01 to 1 inch; 52 had from 1·01 to 2 ins.; 39 had 2·01 to 3 ins.; 17 had 3·01 to 4 ins.; 11 had 4·01 to 5 ins.; 9 had 5·01 to 6 ins.; while 2 each had 6·01 to 7; and 7·01 to 8 ins., respectively. The remaining four largest records for the month were, Waai Kopje (Table Mountain) with 8·11 ins.; St. Michael's with 8·51 ins.; Bishopscourt, 8·80 ins.; and Ceres with 9·11 ins. On subjecting the maximum falls in 24 hours to a similar analysis, it is found that the daily rainfalls were mostly very light, as, omitting the 17 with "Nil," no fewer than 231 or 78 per cent. of the total number furnishing the necessary details (*i.e.* 298 in all) had maximum daily intensities ranging from 0·01 to 1 inch; 33 had between 1·01 to 2 ins.; and only 12 exceeded 2 inches in any day, the two (2) greatest being 3·00 ins. at Springbokfontein on the 6th and 3·30 ins. at Ceres on the 29th. The *Thunderstorms* were mostly local, being experienced at 31 stations on 9 days of the month, most numerous on the 6th and 18th. *Hail* fell at 4 stations on 4 days, *viz.*, the 18th, 19th, 23rd and 29th, in connection with thunderstorms on those days. *Sleet*, occurred at altogether 37 places on 12 days of the month principally on the 23rd, 24th and 30th. Precipitation assumed the form of Snow at 15 stations on 6 days, *viz.*, 22nd to 25th, 29th and 30th, most widely on the 23rd and 30th. Snow was reported over a fairly wide area, chiefly at the more elevated stations, from Kokstad to Carnarvon and from Quacha's Nek to Quagga's Kerk.

Temperature, Cloud, and Wind—The mean temperature of all the stations during this month was 54·5° or 3·5° colder than in May, the mean maximum (56·0°) being 2·6°, and the mean minimum (43·1°) 4·3° less than during the previous month. In this respect, June, 1906, forms a very marked contrast to the corresponding month of the previous year, the mean monthly temperature being 0·8° warmer than the normal, whereas during 1905 it was more than 2° lower than the average. The excess in the mean temperature was due to the mean night temperature being 2° higher, although the mean day temperature was 0·3° lower than usual. There was thus a reduction in the mean daily range (22·9°) of no less than 2·3°. Generally speaking, the mean temperature was above the average by amounts varying from 1 to 3 degrees, although the stations in Namaqualand, Rhodesia, part of Kaffraria and the Northern Border, shew a deficit of about 1 degree (1° F.). The mean maxima at many stations were above the average by amounts varying from 0·3° to 4°, although at other they were either equal to or below the normal by varying amounts. A similar statement is applicable to the minimum temperatures, although the excesses in this case were much greater. The excess in mean temperature was least (0·1°) over the South-West, but increased to 2·3° F. along the South and South-East Coasts and inland, being as much as 4·7° at Moshale's Iloek in Basutoland and 4° at Stutterheim. The mean warmest station was Port St. John's, with 63·1° and the mean coldest, Hanover with 45·3°, a difference of 17·8°. The station having the highest mean maximum was Port St. John's, where it amounted to 74·3° as against the lowest mean minimum of 29° at Palmietfontein. The warmest period was most generally from 14th to 18th, particularly on the 15th, although a fair number of maximum day temperatures were recorded between the 2nd and the 8th, with a few on the 22nd and 23rd. The coldest mornings were usually those from the 21st to 29th, although some of the minima occurred on the 3rd to 5th, and also on the 11th. The mean of the highest readings at the various stations was 77·6°, and of the lowest, 35·5° yielding a mean monthly range of 42·1°, a decrease of 2·9° as compared with May, when the corresponding values were 4·7° and 1·8° higher. The extreme readings for the month were 87·0° at East London on the 15th and 21·0° at Hanover on the 27th, an extremely monthly range of 66·0°.

Although the month was considerably warmer than usual, *Frosts* were noted daily from altogether 109 stations. Some of these were of considerable severity and were most numerous reported from 7th to 11th, and from the 26th to the end of the month. Broadly speaking, the skies were much more obscured than usual over the West and South-West, and in the more northerly parts of the Cape Colony, but were clearer than usual along the South and South-East Coasts, and apparently in Rhodesia. The mean amount of *Cloud* during the month amounted to 37 per cent., or 3 per cent. more than usual, being greatest (72 per cent.) at Disa Head (Table Mountain) and least (16 per cent.) at Umtata. It was mostly between 55 and 70 per cent. over the South-West, 25 and 40 per cent. along the Coasts, and generally between 30 and 35 per cent. in the interior.

Fogs or Mists were comparatively infrequent, being noted only on 87 occasions on

twenty seven days of the month. They were most numerous on the 3rd, 4th, 6th, 22nd, 23rd, 29th, and 30th, but were apparently entirely wanting during the warm period from the 14th to the 16th.

The prevailing morning *Winds* were North-Westerly (i.e. N. to W.) over the greater part of the country, with frequent calms, particularly in the more inland portions, although they were reported as Easterly at Port Nolloth, North-Easterly at Kimberley, and South-Easterly over the more central and northerly portions of the High Veld and at Hopefontein. The month was unusually calm on the whole, the mean force on the Beaufort Scale being only 1.88 corresponding to a mean velocity of 12.4 miles per hour, or 1.2 miles per hour more than in May. The wind was reported as attaining the force of a *Gale* at 23 stations on eleven days, particularly on the 6th. *Hot Winds* were noted at single stations on four days, while a similar number of *Duststorms* were reported during the month.

Earthquake Shocks were felt at Kokstad on the 21th and 27th, but caused no damage.

OBSERVERS' NOTES, JUNE, 1906.

GROOT DRAKENSTEIN.—Temperature about normal. Rainfall 1.82 below average for month (13 years) 6.67 ins.; 60.4 below average for January-June (13 years) 18.02, a deficiency of 93°.

KOKSTAD.—Warm days, cold, and usually frosty, nights; mostly calm weather, with occasional gales, mark this month. Two shocks of earthquake, neither severe, were felt on 24th and 27th. Snow fell in town on night of 23rd, but had melted by morning. The surrounding mountains were well covered. Measles and mumps are very prevalent still.

THEEFONTEIN.—Prevailing winds—N.W. Continuous frosts from the 8th.

THE MEADOWS (Schoombie).—Weather has been very changeable all through, and is very unsettled at present.

NEWLANDS (Barkly West).—Hartz River not running.

VAN WYK'S VLEI.—Frosty mornings, bright days, light winds.

SUNNYSIDE (Albany).—Hot north winds with an occasional cold N., N.E., and N.W. wind during first half of the month.

CARNARVON FARM.—The 0.61 in. rainfall for this month is made up of useful little showers, and greatly benefits crops sown April and May, though not enough to do more than keep well-rooted crops alive. Bar 1905, the 19 frosts are the least we have ever had for June, 16 was the number recorded in 1905. Twelve windy days, which is slightly below the average. Six cloudless days is slightly over the average. Taken all round, this has been a mild winter. Stock fat, and no deaths so far. Agriculturally not so bright, as very little ploughing has been done. Last winter all crops about here were devastated by locusts; this winter they are absent, so far.

DORDRECHT.—The month has been very cold on the whole.

KOKSTAD (Gaol).—Country dry and parched. Severe frosts in mornings.

TEMPERATURE, JUNE, 1906.

Stations.	Mean Max.	Mean Min.	Monthly Mean.	Abs. Max.	Date.	Abs. Min.	Date.
Royal Observatory ..	62.6	50.9	56.8	75.2	15	43.9	5
S. A. College ..	64.1	49.5	56.8	82.0	15	43.5	24
Wynberg ..	64.6	48.3	56.4	82.2	15	44.2	28
Simon's Town ..	66.0	52.6	59.3	83.9	15	49.9	28 & 29
Sea Point ..	64.1	50.2	57.2	73.6	6	45.0	13
Groot Constantia ..	63.4	48.8	56.1	81.0	15	44.0	26
Robertson Plantation ..	68.9	41.4	55.2	85.0	15	32.0	3
Groot Drakenstein ..	64.0	45.0	54.5	81.4	15	36.4	3
Elsenburg Ag. College ..	63.2	45.3	54.2	80.3	15	36.0	24
Ceres ..	61.7	37.8	49.8	72.0	15	31.0	26 & 27
Port Nolloth ..	67.0	45.4	56.2	83.0	7 & 8	38.5	3
O'okiep ..	63.4	43.1	53.2	78.0	5	32.0	27
Storm's River ..	68.5	43.3	58.4	83.0	14	40.0	4
George Plantation ..	66.8	48.5	57.7	82.0	6	44.0	28
Cape St. Francois ..	67.0	55.3	61.2	84.0	14, 15 & 16	44.0	11
Van Staaden's River ..	69.4	47.6	58.5	81.0	17	40.0	21 & 22
Port Elizabeth ..	69.4	53.4	61.4	83.0	14, 15 & 16	47.0	21
Cape L'Agulhas ..	63.2	51.1	57.1	82.0	15	47.0	28
Amalienstein ..	71.1	38.9	55.0	81.0	14 & 16	29.0	26
Hanover ..	61.0	29.6	45.3	78.0	15	21.0	27
Murraysburg ..	61.7	36.3	49.0	70.0	3	27.0	26
Kimberley ..	67.3	36.8	52.0	75.0	6	29.1	24
East London ..	72.7	51.4	62.0	87.0	15	46.0	21
Sydney's Hope ..	65.5	48.1	56.8	74.8	16	34.0	24
Stutterheim ..	68.8	48.0	58.4	77.0	4	39.5	13
Bedford ..	69.1	45.0	57.0	79.0	4	36.0	28
Cathcart ..	62.3	42.6	52.4	70.2	19	34.3	26
King William's Town ..	74.0	45.7	59.8	85.0	15 & 17	37.0	13 & 21
Evelyn Valley ..	64.0	46.0	55.0	75.0	14 & 15	37.0	23 & 24
Queenstown ..	66.2	39.5	52.8	74.0	3, 4 & 18	28.0	11 & 23
Aliwal North ..	63.7	32.3	48.0	70.5	18	25.0	28
Rietfontein (Aliwal North) ..	59.1	33.8	46.4	65.1	18	26.2	27
Palmietfontein ..	61.8	29.0	45.4	68.0	18	23.0	26 & 28
Main ..	68.2	43.0	55.6	75.1	14	30.4	26
Port St. John's ..	74.3	51.9	63.1	84.0	3	40.0	27
Tabankulu ..	68.0	42.4	55.2	77.5	22	36.0	21 & 24
Umtata ..	73.0	37.3	55.2	81.0	2	31.0	28
Kokstad (The Willows) ..	65.9	32.8	49.4	76.0	15	26.0	28
Teyateyaneng ..	61.5	30.7	46.1	68.0	23	24.0	24
Mohalie's Hoek ..	62.3	33.1	47.7	69.0	15	24.0	25
Leribe ..	62.5	29.1	45.8	68.3	22	22.0	24
Hope Fountain ..	69.7	41.0	56.8	78.0	7	36.5	26
Means ..	66.0	43.1	54.5	77.6	..	35.5	..
Extremes ..	..	..	..	87.0	17	21.0	27

RAINFALL, JUNE, 1906.

I. CAPE PENINSULA :

	INCHES.
Royal Observatory (a) 12 inch gauge ..	2·68
Cape Town, Fire Station ..	3·04
Do South African College ..	2·92
Do Sea Point (Hall) ..	2·85
Do do. (Attridge) ..	3·06
Do Molteno Reservoir ..	4·19
Do Platteklip ..	5·44
Do Signal Hill ..	2·80
Table Mountain, Disa Head ..	4·45
Do Kasteel's Poort ..	7·52
Do Waai Kopje ..	8·11
Do St. Michael's ..	8·51
Newlands (Montebello) ..	6·61
Bishopscourt ..	8·80
Kenilworth ..	5·92
Plumstead (Culmwood) ..	5·62
Wynberg (St. Mary's) ..	7·10
Groot Constantia ..	5·32
Tokai ..	4·65
Simon's Town (Wood) ..	3·78
Do. (Gaol) ..	3·16
Maitland Cemetery ..	2·67
Robben Island ..	2·43
Camp's Bay ..	3·13
Fish Hoek ..	2·38
Cape Point ..	1·60
Muizenberg (Storage Res.) ..	4·91
Woodstock (Hall) ..	3·61
Do (Municipal Quarry) ..	5·07
Do (with Nephers Shield) ..	5·38

II. SOUTH-WEST :

Eerste Rivier ..	3·47
Klapmuts ..	4·47
Stellenbosch (Gaol) ..	3·88
Somerset West ..	2·79
Paarl ..	4·87
Wellington (Gaol) ..	3·31
Porterville Road ..	3·14
Tulbagh ..	2·86
Kluitjes Kraal ..	5·52
Ceres ..	9·11
Caledon ..	1·36
Worcester (Gaol) ..	1·36
Do (Station) ..	1·08
Hex River ..	2·92
Robertson ..	1·29
Groot Drakenstein (Weltevreden) ..	4·85
Ceres Road ..	5·75
De Doorns ..	2·39
Karremelks River ..	2·48
Robertson (Govt. Plantation) ..	1·18
Elsenburg Agricultural College ..	3·87
Roskeen ..	2·16
Danger Point ..	1·81
Vruchtbaar ..	4·24

III. WEST COAST :

Anenous ..	2·25
Klipfontein ..	2·17
Kraaifontein ..	2·08

III. WEST COAST :—continued

O'okiep ..	3·49
Springbokfontein (Gaol) ..	4·61
Kersfontein ..	1·51
The Towers ..	2·63
Dassen Island ..	2·73
Malmesbury ..	2·78
Piquetberg ..	2·76
Van Rhynsdorp ..	1·05
Glanwilliam (Gaol) ..	2·50
Lilyfontein ..	5·57
Zoutpan ..	1·82
Wupperthal ..	4·53

IV. SOUTH-COAST :

Cape L'Agulhas ..	1·88
Bredasdorp ..	1·36
Swellendam ..	1·45
Vogel Vlei ..	0·25
Riversdale ..	0·96
Geelbok's Vlei ..	0·60
Mossel Bay ..	0·03
George ..	1·07
Harkerville ..	2·49
Centilivres ..	1·23
George (Woodfield) ..	1·0
George (Plantation) ..	1·07
Knysna ..	1·54
Plettenberg Bay ..	1·56
Blaauwkrantz ..	2·14
Storm's River ..	2·33
Witte Els Bosch ..	0·71
Cape St. Francis ..	2·92
Zuurbraak ..	1·73
Great Brak River ..	0·41
Witteklip ..	2·67
Van Staaden's (upper) ..	3·00
Do (lower) ..	2·43
Uitenhage ..	1·45
Do (Park) ..	1·37
Port Elizabeth (Harbour) ..	3·21
Tankatara ..	1·49
Lottering ..	1·81
Shark's Rivier (Nursery) ..	3·18
Do (Convict Station) ..	2·67

V. SOUTHERN KAROO :

Touws River (D. E's. Office) ..	2·40
Ladismith ..	0·94
Amalienstein ..	1·26
Calitzdorp ..	0·35
Oudtshoorn ..	0·64
Uniondale ..	1·68
Verkeerde Vlei ..	2·86
Bok River ..	3·47
Triangle ..	2·60
Pietermeintjes ..	1·30
Grootfontein ..	0·17

VI. WEST CENTRAL KAROO :

Matjesfontein ..	1·01
Fraserburg Road ..	0·03
Prince Albert ..	0·87

VI. W. C. KAROO:—*continued* INCHES

Zwaartberg Pass	2.49
Beaufort West	0.31
Nel's Poort	0.27
Baaken's Rug	0.20
Willowmore	0.67
Steytlerville	0.05
Laingsburg	0.27

VII. EAST CENTRAL KAROO:

Buffels Kloof	0.43
Aberdeen (Gaal)	0.25
Aberdeen Road	0.10
Kendrew	0.10
Do (Holmes)	0.12
Graaff-Reinet	0.29
Do (Eng. Yard)	0.24
New Bethesda	0.52
Roodo Bloem	0.22
Glen Harry	0.52
Bloemhof	0.55
Bethesda Road	0.90
Jansenville	0.00
Patrysfontein	0.65
Toegedacht	0.00
Klipfontein	0.19
Pearston	0.41
Somerset East	0.77
Corndale, (Div. of Aberdeen) ..	0.15
Middelwater	0.63
Darlington	0.21
Spitzkop (Graaff-Reinet)	0.33
Bruintjeshoogte	1.25

VIII. NORTHERN KAROO:

Calvinia	1.91
Sutherland	1.52
Rheboksfontein	0.10
Fraserburg	0.28
Carnarvon	0.13
Brakfontein	0.16
Victoria West	0.17
Britstown	0.07
Murraysburg	0.73
De Kruis	1.01
Hanover	0.26
The Willows	0.26
Middelburg	0.56
Colesberg	0.00
Craddock	0.27
Steynsburg	0.46
Quagga's Kerk	2.54
Tarkastad	1.03
Do (D/I)	0.92
Varken's Kop	0.21
Glen Roy	0.66
Wilbebeestkooij	0.07
Droogfontein	0.23
Maraisburg	0.45
Waverley	0.26
Schuilhoek	0.44
Vosburg	0.07
The Meadows (Schoombie)	0.30
Theefontein, (Div. Hanover) ..	0.53

IX. NORTHERN BORDER: INCHES

Kenhardt	0.06
Van Wyk's Vlei	0.03
Dunmurry	0.24
Douglas	0.10
Newlands (Div. Barkly West) ..	0.00
Kimberley (Gaal)	0.04
Do (Stephens)	0.06
Barkly West	0.00
Upington	0.02
Trooillapspan	0.06
New Year's Kraal	0.06
Karree Kloof	0.11
Strydenburg	0.20

X. SOUTH-EAST:

Melrose (Div. Bedford)	0.49
Fairholt	1.24
Cheviot Fells (Bedford)	1.69
Bedford (Gaal)	0.92
Sydney's Hope	1.75
Cullendale	0.61
Adelaide	0.91
Atherstone	2.20
Alexandria	2.73
Salem	1.53
Graham's Town (Gaal)	2.77
Heatherton Towers (near Graham's Town)	1.00
Fort Beaufort	0.49
Katberg	1.15
Seymour	1.46
Glencairn	4.48
Port Alfred	1.00
Hogsback	2.21
Thaba N'doda	0.84
Peddie	0.46
Cathcart	0.33
Keiskama Hoek	0.99
Crawley	0.06
Thomas River	0.69
King William's Town	0.38
Stutterheim (Besté)	0.04
Dagga Boer	0.51
Lynedoch	1.19
Sunnyside	2.19
Forestbourne	1.38
Kubusie	0.25
Evelyn Valley	3.21
Berlin	0.31
Isidenge	1.74
Peric Forest	1.06
Quacu Forest	0.24
Kologha	0.71
Komgha	1.00
Prospect Farm (Div. Komgha) ..	0.71
East London, West	1.34
Fort Cunynghame	0.96
Bolo	0.80
Fort Fordyce	1.86
Chiselhurst	0.92
Cata	1.00
Wolf Ridge	1.44
Dontsah	1.37
Mount Coke	0.70
Blackwoods	1.28
Albert Vale (near Bedford) ..	0.69
Cathcart	0.32

XI. NORTH-EAST :			INCHES
Venterstad ..	..	0.36	
Ellesmere ..	..	0.13	
Molteno Station ..	..	0.76	
Thibet Park ..	..	0.95	
Sterkstroom ..	..	0.33	
Rocklands ..	..	0.25	
Aliwal North (Gaol)	..	0.22	
Do (Brown)	..	0.26	
Rietfontein ..	..	0.41	
Queenstown (Gaol)	..	0.43	
Do (Beswick)	..	0.52	
Dordrecht ..	..	0.72	
Tylden ..	..	0.29	
Herschel ..	..	0.44	
Lady Grey ..	..	0.48	
Lady Frere ..	..	0.31	
Keilands ..	..	0.00	
Barkly East ..	..	0.39	
Aliwal North (D's. Eng)	..	0.19	
Whittlesea ..	..	0.53	
Lyndene ..	..	0.35	
Palmietfontein ..	..	0.00	
Blikana ..	..	0.50	
Albert Junction ..	..	0.35	
Hughenden ..	..	0.20	
Glen Wallace ..	..	0.47	
Indwe (D. E's Office)	..	0.28	
Rhodes ..	..	0.65	
XII. KAFFRARIA :			INCHES
Idutywa ..	..	0.32	
Willowvale ..	..	1.22	
Mount Fletcher ..	..	0.00	
Elliotdale ..	..	1.15	
Mqanduli ..	..	0.30	
Umtata ..	..	0.47	
Kokstad ..	..	0.21	
Port St. John's ..	..	0.54	
Tabankulu ..	..	0.61	
Somerville (Div. Tsolo)	..	0.15	
Tsomo ..	..	0.16	
Bazeya ..	..	0.32	
Kokstad (The Willows)	..	0.22	
Flagstaff ..	..	0.56	
Insikeni ..	..	0.03	
XIII. BASUTOLAND :			INCHES
Mohale's Hoek ..	..	0.29	
Qacha's Nek ..	..	0.06	
Teyateyaneng ..	..	0.24	
Leribe ..	..	0.18	
Maseru ..	..	0.20	
XV. NATAL			INCHES
Durban, Observatory	..	1.02	
XVII. BECHUANALAND :			INCHES
Vryburg ..	..	0.00	
Taungs ..	..	0.00	
Setlagoli ..	..	0.00	
XVIII. RHODESIA :			INCHES
Rhodes Matopo Park	..	0.01	
XII. KAFFRARIA :			INCHES
Ida, Xalanga ..	..	0.42	
Cofimvaba ..	..	0.15	
Main ..	..	0.17	
Engcobo ..	..	0.00	
Butterworth ..	..	0.57	
Kentani ..	..	1.21	
Maclear ..	..	0.00	

CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 21st July, 1906, ruling at the several centres named, is published for general information :—

CENTRE.	A Wheat per 100 lb.	B. Wheat Flour. per 100 lb.	C. Roe Meal per 100 lb.	D. Meal per 100 lb.	E. Meal per 100 lb.	F. Barley per 100 lb.	G. Oats per 100 lb.	H. Oat-hay per 100 lb.	J. Pota- toes per 100 lbs.	K Tobacco (Roe Roll) per lb.	L. Beef per lb.	M. Mutton per lb.	N. Fresh Butter per lb.	O. Eggs. per doz.	P. Cattle (Slaughter) per lb.	Q. Sheep (Slaughter)
Althwa North	0 9 0	0 18 6	0 14 0	0 7 6	0 6 0	8 6	10 0	0 5 0	0 5 6	1/8 to 4/-	3d to 8d	3d to 8d	0 2 3	1 9	£9 to £11	21/-
Beaufort West	0 12 0	0 17 0	0 13 0	0 9 0	0 12 6	11 0	10 0	0 5 0	0 10 0	0 10 0	*6d to 1s	*6d to 7d	0 1 9	2 3	£15	23/6
Burgersdorp	0 9 6	0 7 0	0 10 3	0 8 6	0 9 0	8 0	8 0	0 5 0	0 7 6	1/11 to 1/16	8d, 9d, 10d	8d, 9d, 10d	0 1 3	1 10	£16 to £20	25/-
Cape Town	11/6 to 12/	0 7 0	0 12/6 to 13/-	0 8 9	0 8 9	8 0	8 0	0 5 0	0 7 0	0 1 0	0 5	0 5	0 1 9	1 6	...	13/6
Clanwilliam	0 10 3	0 12/6 to 13/-	0 8 9	0 8 9	0 8 9	6 0	7 6	0 4 8	0 10 0	0 9	...	...	0 1 9	1 10	...	...
Colesberg	0 10 3	0 12/6 to 13/-	0 8 9	0 8 9	0 8 9	6 0	7 6	0 4 8	0 10 0	0 9	...	...	0 1 9	1 10	...	...
Dordrecht	0 12 0	0 12 0	0 10 0	0 5 9	0 8 9	6 0	7 9	0 4 0	0 9 0	0 1 6	1/4 to 1/2	1/4 to 1/2	0 2 0	2 3	£22	37/-
East London	0 9 0	0 11 6	0 11 6	0 6 6	0 6 6	6 0	6 6	0 3 0	0 10 0	0 6 6	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	£8	18/-
Graaf-Reinet	0 9 0	0 11 6	0 11 6	0 6 6	0 6 6	6 0	6 6	0 3 0	0 10 0	0 6 6	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	...	...
Graham's Town	0 9 0	0 11 6	0 11 6	0 6 6	0 6 6	6 0	6 6	0 3 0	0 10 0	0 6 6	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	£10 10s to £11	18/- to 20/-
Kimberley	0 10 6	0 15 0	0 13 0	0 6 0	0 8 9	6 0	6 6	0 3 0	0 10 0	0 6 6	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	£13 10s	£1 6s.
King Wm's Town	0 7 6	0 7 3	0 11 9	0 5 9	0 7 6	3 6	6 6	0 3 0	0 7 6	0 6 6	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	...	...
Malmesbury	0 9 0	0 14 6	0 10 6	0 11 0	0 11 0	3 6	6 6	0 3 0	0 14 0	0 6 6	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	...	...
Mossel Bay	0 10 6	0 15 0	0 15 0	0 16 0	0 16 0	4 0	8 0	0 2 0	0 13 6	0 1 0	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	...	...
Port Alfred	0 10 6	0 15 0	0 15 0	0 8 0	0 15 0	4 0	8 0	0 2 0	0 13 6	0 1 0	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	...	...
Port Elizabeth	0 6 6	0 11 3	0 6 3	0 7 0	0 7 0	5 0	6 0	0 3 6	0 13 6	0 1 0	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	...	...
Queen's Town	0 6 6	0 11 3	0 6 3	0 7 0	0 7 0	5 0	6 0	0 3 6	0 13 6	0 1 0	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	£10 14s	20/- to 22/6
Tarkastad	0 10 6	0 13 0	0 12 0	0 9 0	0 12 0	8 0	7 6	0 5 0	0 10 0	0 1 3	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	£12	19/-
Vryburg	0 11 6	0 13 0	0 14 3	0 7 6	0 9 0	8 0	7 6	0 5 0	0 10 0	0 1 3	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	£13	20/-
Worcester	0 9 6	0 13 6	0 10 6	0 8 0	0 9 0	8 0	8 0	0 4 0	0 8 0	0 6 6	1/4 to 1/2	1/4 to 1/2	0 1 3	1 3	£10 to £15	22/- to 25/-

NOTE.—A blank space denotes "no transactions."

* Colony

Frozen.

DEPARTMENTAL NOTICES.

Guano Depot at Port Elizabeth.

A depot has been established at Port Elizabeth, from which supplies of guano from the Government Islands are obtainable at the following prices, viz.:—Ordinary Guano, £6 per ton of 2,000 lbs., or 12s. per bag of 200 lbs., rail free to any station, provided the cost of railage from Cape Town to such station is not less than from Port Elizabeth.

A bag is the smallest quantity which will be supplied. Orders should be addressed to Messrs. Tongue and Patterson, Port Elizabeth, *and must be accompanied by cash or remittance.*

Establishment of Depots for sale of Bone Meal.

From and after July 5, and until further notice, Bone Meal will be supplied to *bona-fide* Stock Farmers at the Depots established for the purpose, subject to the conditions specified in the subjoined Schedule. Government Notice No. 1,215 of 1905 is hereby cancelled.

P. J. Du Toit,
for Director of Agriculture.

Schedule of Conditions.

1. Applications for Bone Meal may be registered by *bona-fide* stock farmers at any Depot duly appointed for the purpose. *A list of such Depots and of the Agents follows this notice.*

2. The Depot Agent shall order from the following firms, or any one of them, or from such firms as may hereafter be notified from time to time, at the prices stipulated, not less than five (5) tons of Bone Meal at one time, viz.:—

Firm.	Address.	Price per ton nett.
Alexander Bros.	Broad Street, Port Elizabeth.	£7 15s. in 5 ton lots, free on rail, Port Elizabeth.
Brown Bros.	Glen Avon, Somerset East.	£7 15s. in 5 ton lots, free on rail, Somerset East.
Wright Bros.	Highlands, near Grahams-town.	£10 10s., free on rail, Highlands.
F. J. Gietzmänn	Froude Street, Kimberley.	£7 15s. in 5 ton lots, free on rail, Kimberley.

The prices quoted will hold good until the 31st October, 1906.

3. If any applicant or applicants shall desire the Depot Agent to order from any one of the abovementioned firms in preference to the other or others he shall do so, provided he has already received applications for the purchase from such firm of not less than 5 (five) tons in the aggregate.

4. Any other firm contracting to supply Bone Meal under these Regulations, and furnishing a written guarantee that their Bone Meal is sterilised, will be included among the firms mentioned in Clause 2 of this Notice.

5. The Depot Agent shall sell such Bone Meal to the registered applicants at the prices above-mentioned.

6. The Government will bear the cost of railage, the cost of transport from the nearest railway station for trade purposes to the Depot, and such commission as may be arranged between the Depot Agent and the Government.

7. The cost of transport from the Depot to the applicant's farm must be borne by the applicant.

8. Upon the Depot Agent delivering over to the Civil Commissioner the railway consignment note and the receipt for transport and producing to him the invoice of the above-mentioned firm, the Civil Commissioner will refund the railway transport charges and pay the Depot Agent's commission on the quantity of Bone Meal ordered, provided such quantity be not less than 5 (five) tons.

Depot Agents for Supply of Bone Meal.

The undermentioned firms have been appointed Agents for the supply of guaranteed sterilised *Colonial* Bone Meal to *bona-fide* stock farmers in terms of the Regulations published in the preceding notice at the prices there specified :--

ALBANY.—Duffield Bros, Grahamstown; J. O. Walker, Alicedale; T. F. Hill, Salem.

ALEXANDRIA.—C. M. Bruton, Sandflats.

BARKLY WEST.—A. E. du Toit, Barkly West; W. E. Thomson, Boetsap; Beadle & Barker, Daniels Kuil; G. C. Wakeford, Klipdam.

EAST LONDON.—H. Ries & Co.

HAY.—S. W. Smith, Griquatown; C. Barnard, Matzap; Van Nickerk Bros., Nickerk's Hope; A. Gers, Papkuil; N. J. van Druten, Postmasburg.

HERBERT.—Dreyer & Mussman, Campbell; J. C. W. de Villiers, Douglas; Borgman Bros., Schmidtsdrift.

KIMBERLEY.—Bennie & Co., Kimberley; Cohen Bros., Warrenton.

KING WILLIAM'S TOWN.—W. West, King William's Town; A. G. Brown, Kei Road.

KNYSNA.—Thosen & Co., Ltd.

KOMGHA.—H. V. Brown.

MAFEKING.—Springall & Krause, Mafeking; Mrs. M. Fraser, Setlagoli.

UITENHAGE.—C. Hansen, Thornhill.

VRYBURG.—M. Colley, Oliphant's Hoek, Kuruman; J. S. Brophy, Taungs; S. Solomon & Co., Vryburg.

Government Notice No. 1,352, dated 15th December, 1905, is hereby superseded.

P. J. Du Toit,
For Director of Agriculture.

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town. Members of Farmers' and Fruit Growers' Associations applying for same through the Secretaries of these Associations are supplied free of charge.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V. of *Agricultural Journal*.

Artificial Grasses and Fodder for Stock; Ensilage; Treatment of Cereal and other Crops; Viticulture and Wine Making; Forestry; Locusts and their Destruction; Possible New Industries for Cape Farmers; Stock Farming; Dairying; Fruit Culture (6d.)

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Brak Land in Relation to Irrigation and Drainage (1d.); The Velvet Bean (1d.); Potato Disease (1d.); Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d.); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (3d.); The Salt Bushes (1d.); Tobacco Culture by P. Bornemisza (1d.); The Cultivation of Tobacco in the Colony by K. Schenck (3d.); Tobacco Wilt in Kat River Valley (1d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d.); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); *Butter and Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Cabbage Aphis (1d.); Codling Moth in Madeira Fruit (1d.); *Codling Moth (1d.); Fruit Fly (1d.); Fumigation Supplies (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d.); *Peach Yellows (1d.); Pear Slug, Paris Green (1d.); Remedy for Mestwurmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.); Scale Insects on Ornamental Trees and Plants (1d.); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d.); Fumigation under Box Covers (1d.); The House Fly (1d.); New Oak Tree Pest (1d.); Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.); Another Introduced Scale Pest (1d.); Washes for Red Scale (1d.); Fruit Fly: Peach Fly (1d.); Lime-Sulphur-Salt-Wash for Scale Insect (1d.); The Fruit Moth (1d.); Fusieladium of the Apple and Pear (1d.); Mealie Stalk Borer (3d.).—coloured plate; Cleaning up Nursery (1d.); Natural Enemies of the Fruit Fly: Report on Investigations in Brazil (1d.); Locust Birds and Locust Poison (1d.); The Brazil Fruit Fly Parasites (1d.); Cyanide Gas Remedy for Scale Insects (3d.)

Forestry.

British National Forestry (1d); Botanical Observations on Forests in Eastern Pondoland (1d.); †Elementary Principles of Sylviculture or Woodcraft (1d). National Forests (1d.); Indigenous Timbers of the Cape (1d.); Misuse of Coal and the Uses of Forests (1d); Tree Planting for Timber and Fuel (1d.); Tree Planting for Farmers (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Fisheries.

Trout and Carp Breeding and Stocking of Streams (1d.); *Methods of Preserving Fish by Smoking (1d.); Portable Floating Hatching Box for Trout Ova (1d.); The Protection of Trout (1d.); The Ocean and its Resources (1d.)

Horticulture

Fruit Culture in the Gamtoos River Valley (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (6d.); The Olive at the Cape (2d); Tomatoes and Fruit for Export (1d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.); *Fruit from Orchard to Buyer (1d.); Netting for Fruit Trees (1d.); Fruit Culture in Argentina (1d.); Vegetables for Exhibition (1d.) Chrysanthemum Rust (1d.)

Veterinary and Animal Industry,

*Anthrax, Charbon, Miltzbrand or Miltziekte (1d.); *Heartwater (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d.); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstocks Report on Inoculation for Rinderpest (1d.); *Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.); *Sheep and Wool (1d.); The Eye and its Diseases (1d.); Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhoea in Calves (1d.); Persian Sheep and Heartwater (1d.); Poisoning of Stock (1d.); Retention of the Foetal Membrane, or Afterbirth in Cows (1d.); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Transmission of African Coast Fever (3d.); Tuberculosis and the Use of Tuberculin (1d.); African Coast Fever with Description of Dipping Tank (3d.); *Rinderpest in South Africa (3d.) by D. Hutcheon; *Fluke or Slak in Liver of Sheep (3d.)—*coloured plate*; *Anthrax or Miltziekte and Quarter Evil or Sponsziekte (1d.); Osteo Porosis (3d.)—*coloured plates*; *Glanders (3d.)—*coloured plate*; *Animal Castration (1d.); *Preventive Inoculation for Redwater (1d.); *Abortion in Cattle (1d.); Treatment for Worms in Domestic Animals (1d.); *Lungsickness of Cattle, Contagious Pleuro-Pneumonia, or Pleuro-Pneumonia-Bovum-Contagiosa (1d.); *Swine Fever, Hog Cholera or Pig Typhoid (3d.)—*coloured plates*; Castration of Females and Animals other than the Horse (1d.); Poisoning of Horses by *Ornithogalum Thyrsoides* or Chinkerinchee (*coloured plate*) (3d.); Diseases of the Horse and their Treatment (1s.); Horse Sickness by D. Hutcheon (2d.); Ticks and African Coast Fever (1d.); Cirrhosis of the Liver in Stock (1d.); Liver Disease among Calves (3d.); The Arsenite of Soda Dipping Mixture (1d.)

Viticulture.

†Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d.); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d.); Manufacture of Dry Wines in Hot Countries (3d.)

Miscellaneous.

Game Seasons (3d.); Land Laws of Cape Colony (1d.); †Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c. 1d.; Transvaal Plant Import Regulations (1d.) Bars in Ostrich Feathers (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

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SMYTH & CRAWFORD,
35, Wale Street, CAPE TOWN.

(One Door above Loop Street.)

THE PRODUCE MARKET

CAPE TOWN.

Mr. R. Müller, of Strand Street, reports under date, July 20th:—

Ostrich Feathers.—The market has been well supplied. Competition is not quite so keen, as lower prices are expected at the forthcoming auctions. Some very nice parcels have been offered, and fair prices obtained for good quality. Common quality is somewhat neglected.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.		
Super Primes	10	0	0	35	0	0	Floss	..	0	5	0	1	10	0	
Firsts, Ordinary							Long Drabs	..	2	10	0	4	10	0	
to Super	..	8	0	0	10	0	0	Medium Drabs..	1	5	0	2	0	0	
Seconds	..	5	0	0	7	1	0	Short to Medium	0	10	0	1	10	0	
Thirds	..	3	10	0	4	10	0	Floss	..	0	2	6	1	10	0
Femina (super)	..	7	10	0	9	10	0	White Tails	..	1	15	0	3	0	0
Femina, Seconds							..	Coloured Tails..	0	10	0	1	15	0	
to Firsts	..	4	0	0	6	10	0	Chicks	..	0	1	0	0	2	0
Byocks (fancy)	..	5	0	0	7	10	0	Spadonas	..	2	10	0	4	0	0
Long Blacks	..	1	10	0	7	10	0	Inferior Black &							
Medium Blacks	..	3	0	0	3	10	0	Drabs, Short							
Short to Medium	..	0	10	0	2	10	0	to Long	..	0	0	6	1	10	0

Wool.—The London sales opened on the 10th July. Compared with prices ruling at the previous auctions, Scoured Wools were one penny, Light Green one half-penny, and Heavy Grease three farthings cheaper. Our market is quiet, and only odd lots, suitable for washing purposes, are offering. Prices for Short and Light Parcels range from 5d. to 7d.; for long, from 5½d. to 7½d.; Extra Super. Lots up to 8½d.

	s.	d.	s.	d.		s.	d.	s.	d.
Super Long Grass Veld	Short and Inferior	..	0	4	0 4½
Wool	..	0	8	0 9½	Wool for Washing	..	0	4½	0 6
Super Long Karoo Veld	Snow-white Super to Extra	1	7	1	10
Wool	..	0	6½	0 7½	Ordinary	1	1	1	6
Medium Karoo Veld Wool	0	5	0	5½	Fleece Washed	..	0	0	0 9½

Mohair.—There is little enquiry for anything except Super. Long; prices for these are from 15d. to 15½d.; Super. Kids may be quoted from 18½d. to 19d.; Mixed Kids from 15½d. to 17d.; Ordinary Firsts from 13d. to 15d.

	s.	d.	s.	d.		s.	d.	s.	d.
Mohair, Firsts, Summer	1	1	1	3½	Mohair Winter	..	0	10½	1 0½
Kids	..	1	3	1 7	Kids	..	1	0	1 3
Seconds	..	0	6½	0 9½					

Skins and Hides.—There is a good demand for all classes; prices are, however, lower for Sheep Skins and Goat Skins.

	s.	d.	s.	d.		s.	d.	s.	d.
Long Wool Skin	..	0	7	0 7½	Cape Skins (cut), each	..	..	1	6
Short	..	0	6½	0 7	Goat Skins, heavy to	..	..	..	..
Shorn	..	0	6	0 6½	light	..	0	11	1 0
Bastards	..	0	6	0 6½	Sundried	..	..	..	0 7
Cape Skins, each	..	2	3	2 6	Angoras	..	0	0½	0 7½

PORT ELIZABETH.

Messrs. John Daverin and Co., report under date July 20:—

Ostrich Feathers.—The market was heavily supplied this week with an assortment much above the usual average quality. Competition was fairly active, and prices, if anything, in favour of sellers. There has been a little more enquiry out of hand, and some sales have been made at rather better prices than could be obtained last week. Among the large consignments offered by ourselves was a plucking grown on Mrs. W. Distin's farm, "Bowden Hall" (Middelburg). This plucking is considered the finest that has ever been offered on this market, and the quality and general excellence of the feathers caused great admiration. Every line was keenly competed for, and some

extreme prices were realized. For instance:—Primes: £51, £45, £29, £27, etc., etc.; Feminas: £14 10s., £14, £13 15s., £13 5s., £13, etc.; Fancy: £11 10s., £9 17s. 6d., etc.; Long Blacks: £10, £7 17s. 6d.; Medium Blacks: £1 17s. 6d., £1 5s., etc.; Light Tails: £3 10s.; Greys: £10 17s. 6d.; Long Drabs: £5, £4; White Tails: £1 17s. 6d.; Dark Tails: £1 14s.

The plucking weighed altogether 202 lbs., and realized £1,710, or an average of £8 10s. per lb. all round. The next London sales open on Monday the 30th inst., when only a moderate quantity will be offered, and it is generally expected that prices will shew little or no change. The total quantity sold on our Public Market this week amounted to £12,854 16s. 2d., and weighed 4,921 lbs. 10½ ozs.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
Primes: Extra super				Special Prices.			Blacks: Long..	2	10	0	4	0	0
Good to super	9	0	0	12	0	0	Medium ..	1	0	0	2	5	0
Whites: Firsts	7	0	0	9	0	0	Short ..	0	10	0	0	15	0
Seconds ..	5	0	0	7	0	0	Wirey ..	0	1	0	0	1	6
Thirds ..	3	0	0	4	10	0	Floss ..	0	6	0	1	5	0
Feminas:							Drabs: Long ..	1	5	0	2	15	0
Tipped (Firsts)	5	0	0	8	0	0	Medium ..	0	12	6	1	0	0
Seconds ..	3	10	0	5	0	0	Short ..	0	2	6	0	6	0
Thirds ..	2	0	0	3	0	0	Wirey ..	0	0	6	0	1	0
Greys ..	4	10	0	6	10	0	Floss ..	0	6	0	1	5	0
Fancy ..	4	10	0	7	0	0	Spadonas: Light	2	0	0	4	0	0
Tails White ..	1	7	6	3	0	0	Dark ..	0	12	6	1	15	0
Light ..	0	17	6	1	15	0	Chicks ..	0	0	3	0	1	6
Coloured & Dark	0	5	0	0	17	6							

Wool.—The latest London cables report progress of sales as very satisfactory, Snowwhites and scoureds having declined 1d. to 1½d., and grease 1d. per lb., while short grease is reported as almost unsaleable. Our market continues almost at a standstill, and at present it is not possible to sell short grease except at prices that will leave serious losses to the up-country storekeeper. This serious depression does not appear to be caused by any dullness in trade, nor yet by any great increase in the supply, as our latest mail advices report trade as fairly good, and supplies moderate. It seems to be mainly owing to the very unsatisfactory yield of the wools shipped, some lots, we are informed, only giving 25 to 30 per cent. clean wool. On yesterday's public sales only a small quantity was offered, and the tone of the market was very dull and depressed.

Snowwhite Extra						Grease, Short, faulty			
Superior ..	19½d	20d				and wasty ..	5½d	5½d	
Snowwhite Superior ..	17½d	19d				Grease, Coarse and			
Do Good to Superior	16½d	17d				Coloured ..	5½d	5½d	
Do Inferior Faulty	16d	17d				Scoured, Coarse and			
Grease, Super Long, well-						Coloured ..	6½d	10½d	
conditioned, Grass-						Basuto Grease, short..	6½d	6½d	
veld grown (special						O. R. C. Grassveld			
clips) ..	8½d	9d				Grease, long and			
Grease, Super Long well-						well - conditioned			
conditioned, Grass-						(special clips) ..	6½d	7d	
veld grown ..	6½d	7½d				O. R. C. Grassveld			
Grease, Super Long, well-						Grease, long and			
conditioned, Karoo						well-conditioned ..	5½d	6½d	
grown (special clips)	6½d	7d				O.R.C. medium grown,			
Grease, Super Long,						light, with little			
well - conditioned						fault ..	6½d	6½d	
Karoo grown ..	5½d	6½d				O.R.C. short, faulty			
Grease, Super Long,						and wasty ..	5d	5½d	
well - conditioned,						O.R.C. Karoo grown,			
Mixed Veld ..	5½d	6½d				long and well-			
Grease, Light, faultless,						conditioned ..	5½d	6½d	
medium, Grassveld						O.R.C. medium grown,			
grown ..	5½d	6½d				light, with little			
Grease, Light, faultless,						fault ..	5d	6d	
medium Karoo						O.R.C. short, faulty			
grown ..	5½d	6d				and wasty ..	4½d	5d	
Grease, Light, faultless,									
short Karoo grown	5½d								

Mohair.—This market remains quiet, no business having been done in the open market during the week, and at present it appears likely that we will not have any change for the better for at least another month, when we hope to see renewed buying at late current prices. On the public market on Tuesday a fairly large quantity was offered, but, owing to the want of competition, the bulk had to be withdrawn.

We quote the following at nominal values of:—

Super Kids	..	1s	6d	1s	7d	Mixed O.R.C. Hair			
Ordinary Kids	..	1s	4d	1s	5d	(average)	..	0s 11½d	1s 0½d
Superior Firsts, special						Very Mixed O.R.C.			
clips ..	..	1s	3½d	1s	3½d	Hair (average)	..	0s 10½d	0s 11d
Ordinary Firsts	..	1s	3d	1s	3½d	Seconds and Grey	..	0s 8d	0s 9d
Short Firsts	..	1s	1d	1s	1½d	Thirds	..	0s 6¾d	0s 7d
Superfine Long Blue,						Winter Kids	..	none offering.	
O.R.C. Hair	..	1s	2½d	1s	3½d	Do. Hair	..	do.	

Skins.—Sheepskins sold in bundles at 6¾d. per lb.; Pelts at 5¾d.; Capes, 2s. 1d.; damaged, 7d. each; Angoras, 8l.; Shorn, 5¾d.; damaged, 3½d.; Goat, 12d.; damaged, 6d. per lb.; Springbok, 8d. each.

Hides.—Sundried Hides sold this week at 8d., and for damaged 6d.; Drysalted, 7½d.; damaged, 5½d., and Thirds 3½d.

Horns.—Parcels sold all round at 3½d. each.

MONTHLY CAPE TOWN MARKET REPORT.

BY THE COMMERCIAL AGENT OF THE DEPARTMENT OF AGRICULTURE.

Trade generally this month has been very quiet. Large parcels of Colonial lucerne have been placed by this Department. Over 100 tons have been sold at 6s. 6d., 6s. 7d., and 6s. 9d. per 100 lbs., delivered.

Parcels of Onions at 8s. 6d. per bag have also been placed. Two truck-loads of Oathay were placed by the Department at 4s. 3d., delivered.

Orders for 20,000 fresh eggs are awaiting the producer. 12s. 6d. and 13s. delivered is offered for 12 months contracts.

MEAT—Colonial Mutton: Demand good, quality excellent. Dressed carcasses are sold wholesale at 6d. to 6½d. per lb. Imported Mutton: dressed carcasses, 5d. Colonial Beef: dressed carcasses, 5d. to 5½d. Imported beef: dressed carcasses, 5d. to 5½d. Stocks of Imported Mutton and Beef are large.

BUTTER—Demand for Creamery Butter is almost nil. Traders, owing to the advance in price, are unable to do business. Prices, 1s. 6½d. to 1s. 7d., delivered.

MILK.—There is very little demand for Milk at present. Large buyers are committed to yearly contracts, until November and December.

Samples of Colonial Cream Cheese have been submitted, and the quality is equal to the best Devonshire. Prices: wholesale, 4s. 6d. per dozen.

Samples of farmers' stock of Colonial-fod and Colonial-cured Bacon and Hams will arrive shortly. I hope to advise in my next report on quality and price.

Colonial Oathay, 4s. 4d. to 4s. 9d. per 100 lbs. Market a shade easier.

Cut Colonial Hay.—Demand limited. Price, 4s. 9d. to 5s.

Colonial Oats per bag, 150 lbs. Business in oats quiet. Wholesale lots bought at 11s. 7½d. to 11s. 9d., F.O.R. country stations.

Lucerne Hay.—Large quantities are now being offered. Lots sold 6s. 6d. to 6s. 9d. delivered at Cape Town.

Colonial Barley.—Demand fair, 12s. to 12s. 6d. offered for bags of 150 lbs. F.O.R. Country stations.

Colonial Rye.—Scarce. Demand good. Wholesale parcels at 18s. 6d. for 200 lbs., delivered at Cape Town.

Compressed Fodder.—Principally Moorreesburg. Wholesale lots sold at 6s. per 100 lbs., delivered Cape Town.

Cape Colonial Wheat.—Quality excellent. Most millers and buyers fairly well stocked. Demand small at prices asked, viz., 18s. per bag of 203 lbs. F.O.R. up-country stations.

Colonial Eggs.—Fresh Eggs are in good demand. Prices: 12s. to 13s. 6d.; good but not guaranteed, 8s., 9s., and 10s. per 100; delivered.

Potatoes.—Supply equal to demand. Price this last week considerably higher for good quality and large size. Lots sold: medium, 10s. 6d. to 12s.; first quality reached 16s. per bag of 150 lbs.

Sweet Potatoes.—Supply fair. Prices advanced during the month 3s. per bag. Lots sold 9s. per bag.

Onions.—Supply in excess of demand at present. Prices lowered considerably during the month: small, 3s. to 4s. per bag; medium, 5s. to 6s. large, 7s. to 8s. 6d. per bag of 125 lbs.

Should any producer be desirous of opening up business relations with the trade, or should any trader be desirous of being brought into contact with the producer, if they will communicate to the Department their requirements, an effort will be made to arrange mutual business relations.

Agricultural Department, Cape Town, July 25, 1906.

THE Agricultural Journal

OF THE CAPE OF GOOD HOPE.

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All communications should be addressed :

“The Editor, Agricultural Journal, Department of Agriculture, Capetown.”

Telegraphic Address: “Bulletin,” Capetown.

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NOTES.

Revision of the Free List.

We have to call the attention of our readers to the fact that a complete Revision of the Free List of the Agricultural Journal is in contemplation, and to ask them to be careful to see that their names and addresses are entered in time to prevent a break in their volumes. A change has been felt to be necessary for some time past, as the existing system is not by any means sufficiently comprehensive to satisfy the full requirements of the whole Colony. Hitherto, as is generally known, the free issue has been largely confined to members of Agricultural Societies, and Farmers' and Fruit Growers' Associations of a non-political character. Up to a certain point this proved satisfactory, but the farmers of the country are daily looking for more information, and, as there are many districts not served by these exceedingly useful bodies, it is now found to be absolutely necessary to adopt some other system in order to meet the needs of the whole agricultural community.

The Proposed New Scheme.

The system now proposed to be tried is to take the Colony in Districts, all applications to be sent in through the Civil Commissioners and Resident Magistrates. Secretaries of Societies will therefore please note and send in their lists not later than Nov. 15, as the New List, if satisfactory, is to take effect from January 1st. As the farmers have the first claim, these lists must show not only the name and full postal address of the applicant, but also his occupation, and state whether the Dutch or English edition is required. Secretaries of Societies will be supplied with copies for circulation among town members. Individual applicants are requested to follow the same course. It is hoped by this means to secure a wider circulation for the Agricultural Journal, but the scheme will not be adopted in its entirety if the new lists do not fulfil this condition.

To Correspondents.

Correspondents so frequently write without enclosing their names and addresses, or else give an address which is found insufficient, that we are compelled to call attention to these omissions. Will all correspondents please remember to comply with the rule that names and postal addresses are absolutely necessary? They are not asked for out of idle curiosity but to enable the Editor to supply information promptly, as well as to guarantee the *bona-fides* of the writers.

Irregular Delivery of "Agricultural Journals."

Irregularities in the delivery of the *Agricultural Journal* should be reported as soon as possible to the Editor, as otherwise it is impossible to take steps to prevent them. Some go astray in the post through insufficient addresses, while in others the wrappers get damaged in transmission and the addresses become illegible. In short there are many accidents which may cause irregular delivery, but none can be remedied unless the fact is noted. In the case of duplicate copies it is only necessary to return one to the post marking on it the words "Duplicate. Return to Agricultural Department."

Breeders' Directory and Farming Notices.

Many representations having been made to the effect that the usefulness of the *Agricultural Journal* could be extended by arranging for cheap small advertisements for breeders, farmers &c., it has now been decided to devote a certain portion of space in each issue to this purpose. We call attention to the first section in the present issue and trust that farmers and others interested will be able to see their way to supporting the new departure. The charges have been fixed so low as to admit of anything being advertised that is at all worth advertising.

Notes on Butter Packing.

Attention is called to the notes on packing butter for transport, contributed by Mr. Silva Jones, the Dairy Expert, on another page in this issue. They are practical and valuable, as they sharply accentuate the faults which go so far towards depressing local products in the Colonial Markets, viz., bad and careless handling and faulty get-up.

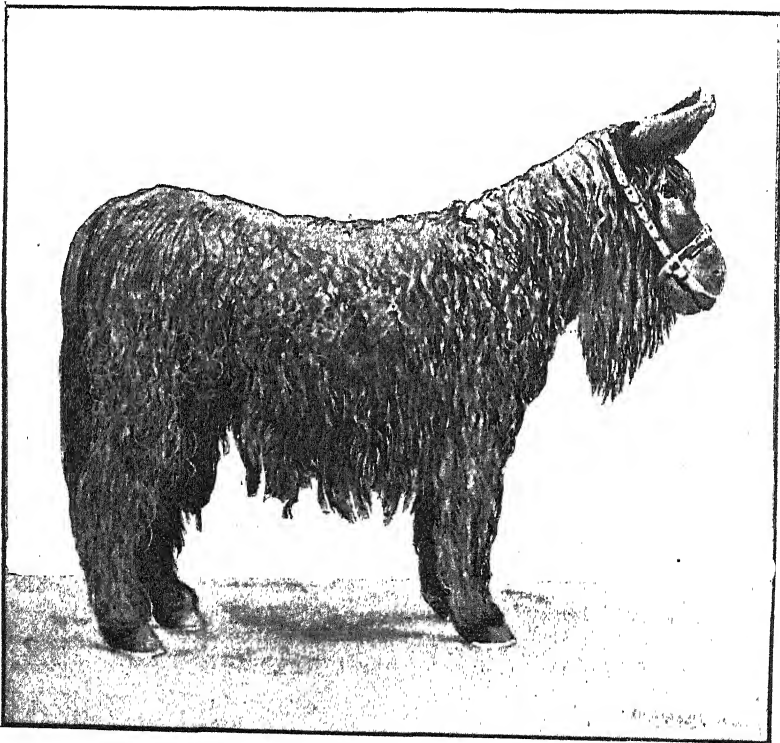
The Castration of Ostriches.

An interesting paper, read by Mr. Elley, Government Veterinary Surgeon, before the Oudtshoorn Farmers' and Fruit Growers' Association, is reproduced in the current issue. The whole question has been discussed in a more or less informal manner on previous occasions and the operation has been successfully performed at various times. But this is the first complete statement of the case placed on record, so far as we can learn. The only points upon which opinions differ is the ultimate effect on the birds themselves. Many ostrich farmers have grave doubts. If it can be established that the feathers of the caponised bird do not fall off in quality, and that the constitution of the bird does not suffer in any way, there can be little doubt as to the great advantages which would accrue by the general adoption of the system. It should, if successful in general practice, tend to improve the industry in many ways, as the caponised birds could be farmed with

much less risk and trouble than the entires, who, as is well-known, are frequently very difficult to keep under control. Another great advantage would be the probability that, by a general adoption of the system, more attention would be paid to the improvement of the birds themselves by selecting none but the very best for breeding purposes. It will be noticed that Mr. Elley points to several distinct advantages which he believes may be confidently anticipated and we believe it would well repay some of the more important ostrich farmers to give the system a fair trial and carefully record the results.

The Poitou Jackass.

The "Poitou Jackass", has often been mentioned in these pages and as some curiosity has been evinced as to the particular type of animal this is, we are glad to have the opportunity of reproducing herewith an illustration of a modern representative of that breed. The animal shewn below was sold recently in France



for £400 to go to South America for Mule-breeding purposes. The characteristics of the Poitou Ass are :—The head and ears are enormous, and the larger they are, the more valuable is the animal considered to be by the breeders. The lips are pendulous. The

neck is strong, thick and broad, but there is a want of wither, as is generally the case with Asses, and the back is very straight. The shoulders are inclined to be upright rather than the reverse; the chest is broad and the limbs simply enormous.—“*Horses, Asses, Zebras and Mules*,” by Tegetmeir & Sutherland.

Dried Fruits and Walnuts for Export.

The commercial possibilities in the establishment of an export trade in dried fruits and walnuts from the Colony to London have more than once been suggested. Information to hand, recently, from the Government Commercial Agent in London gives some information on the subject which is useful for purposes of comparison. It appears that the Californian dried fruit crop partly failed this year, and, as a consequence, there is an opening for the Colonial article. The prices quoted as are follows:—Choice dried Apricots well-graded, it is expected will realise from 65s. to 75s. per cwt. free London. Choice Peaches, 40s. per cwt., free London. Dried Walnuts 25s. per cwt., free London. We may add that the sun-dried walnut as produced in this Colony is preferred to the kiln-dried article usually placed on the European markets. But our markets for the latter product are too good for growers to contemplate exporting at the price quoted. The Oudtshoorn crop of walnuts sold this year in the district at from 5½d. to 6½d. per lb.—equal to 51s. 4d., and 60s. 8d. per cwt., practically speaking, on the farm. Walnuts are a good paying crop on this side and it is somewhat surprising that they are not more extensively cultivated. Mr. Burbank's paper in this issue shews what California is doing. Cannot South Africa, with similar conditions, follow suit?

Germany and its Farmers.

Dr. F. P. Koenig, British Consul at Dusseldorf, in the course of a consular report, calls attention to the many advantages the German farmers enjoy though the deep interest taken in agriculture by the State. Speaking of technical education he says:—“Dairying to-day has become a science in bacteriology; Germany has learnt a lesson in dairying from Denmark, which at one time was the leading dairying country on the Continent. To-day German farmers are doing their very best to compete with Denmark in the British markets, where formerly Denmark had the monopoly.

“The money the German Government has invested in agricultural colleges and technical schools has been a wise investment. The German nation is aware of this, and no money is spared when it is a question of technical or scientific education. Nearly all the German Universities have agricultural colleges

connected with them ; besides those, there are innumerable dairy and technical schools of all kinds, for agriculture as well as for all trades. Dr. Koenig thinks that no one will dispute the fact that Germany owes her great success in all branches of trade and manufacture to her thoroughness in chemistry and its bearing on all branches of industry.

“Dr. Koenig has no hesitation in stating that Germany’s marvellous success in all branches of industry, trades, and agriculture, is due to sound and genuine technical education. German farmers have had their battles to fight; since 1870 it has been uphill work, but German agriculture to-day is prosperous. In Germany throughout the last 25 years (very hard times they were) the farmers have been gradually working their way to the front, and with the assistance of their Government are to-day able to made a good living and get a good return for their capital.

Co-operation and Science.

“Co-operation has been the anchor which has held most firmly ; co-operation in credit banks, loans, sale and purchase of produce, purchase of seeds, foods, minerals, manures, in irrigation and drainage, and last but not least, in dairying.

“Germany is no field for dishonest dealers in cake, mineral manure, seed, and meals ; they get no chance here at all ; science has come to stay among the farmers—among all classes of farmers, great and small ; they all recognise the absolute necessity and the pecuniary benefit bestowed upon them by having due knowledge of chemistry and making use of this science to know how to judiciously feed their stock, produce milk, meat, or muscle, how to feed the crops with certain quantities of nitrogen, phosphates and potash, and make use of the many Government technical, scientific, and chemical testing institutions established for the welfare of the community and all who choose to use them.

“German farmers have recognised long ago that individually they are powerless, but combined they can bring power to bear on any particular Bill, tariff, or burning or vital question of the day. So in business they buy easier and better, and sell with greater profit, and get better terms all round by co-operation. The German statesmen have recognised that a prosperous industrial Germany alone is not so good for the State as a prosperous agricultural country beside it, and hence the German State does all in its power to assist agriculture in every possible way, by a protective tariff, by fair State railway freights, and a thoroughly efficient agricultural scientific education.”

Rabbits.

Mr. H. Le G. Solly, of Sir Lowry's Pass, writes :—" Here-with I enclose a cutting from *The Field* of 28th of July for which I hope you will be able to find space in your journal as the subject is of the greatest interest to all agriculturists in South Africa. It will be seen from the cutting in question that it is purely by a chance dispensation of nature that South Africa generally has not been submitted to a risk of the same plague of rabbits under which Australia is now suffering. We have received rinderpest and East Coast cattle fever from the north and are now threatened with a possible outbreak of rabies and it is only the fact that nature foreseeing the folly of man provided an antidote to the rabbit plague in the red ant which has saved the whole of South Africa from the risk of something approaching ruin as a grazing country.

" And from the report in *The Field* it would seem that the authorities in the Transvaal in 1896 and 1897 and also those in Natal again in 1901 were willing to run this risk by turning out breeding rabbits.

" When I was in Australia in 1886 I frequently met in Sydney the gentleman who had first of all imported rabbits into Australia. He was a well to do man and had a small estate outside Sydney. He first of all imported and turned down a few pairs of rabbits so as to have a little rabbit shooting for his friends and himself. The rabbits did well and he became at first very popular. All the land-owners with a taste for rabbit shooting begged him for a pair of breeding rabbits and as he was a generous man and had plenty of rabbits he sent them off far and wide. At first the possession of a few rabbits and a little rabbit shooting was a feather in a man's cap, now it means ruin to almost a quarter of Australia, and the expenditure of millions. I write this as a warning lest some enthusiast might try the experiment and run the same foolish risk that was run in the Transvaal in 1896 and again in Natal in 1901, in some part of South Africa where nature had not provided the red ant as a safe guard."

The article enclosed contains references to some correspondence which has recently appeared in the Australian papers on the subject. According to this, a Mr. Douglas Blackburn claims to have demonstrated the fact mentioned by Mr. Solly. Mr. Blackburn states that as long ago as 1896 he engaged in the artificial breeding of rabbits in the Transvaal for the purpose of providing a cheap supply of flesh food for the Kaffirs employed on the Rand mines. He began with fifty ordinary does, crossing them with the so-called

Belgian hares imported from England to improve the breed. These rabbits, kept in hutches, did well and bred freely, but it was observed that when the young were turned out into enclosures the results were disappointing and unsatisfactory, and they did not increase with anything like their wonted rapidity. The following year 300 rabbits were turned out near Johannesburg for sporting purposes. The conditions were perfect, and apparently everything was in their favour, but the colony made no progress, and the experiment was abandoned. At a later date 700 were turned down on a large estate near Johannesburg, but again hardly a rabbit was to be seen twelve months afterwards.

In 1901 Mr. Blackburn, at the instance of the colonial government, carried out a series of elaborate experiments in rabbit breeding and rearing at Loteni, in Natal, but with similar negative results. Confined in hutches the animals thrived and bred freely, but when turned out their fecundity greatly diminished, 110 does producing 500 young in nine months, whereas their produce should have numbered nearly as many thousands in that time. Farmers and others in Natal, the Transvaal, and Orange River Colony had just the same experience. Finding that after about a year the rabbits turned out at Loteni had practically ceased to breed, Mr. Blackburn dug up a number of burrows to ascertain, if possible, the cause. He found nests of newly born young covered with red ants, and in process of being devoured alive by these voracious insects. This discovery, on being made known, was soon corroborated by the investigations of others, and thus an explanation was forthcoming which accounts for the almost entire absence of small fur-bearing animals in ant-infested districts. It was found that in those cases only where animals of this kind frequented rocky places too hard for the ants to burrow in were they able to survive. This view was confirmed by an experiment made with a captured rat in young. This animal was confined in an ant-infested stable, and within twenty-four hours of the young being born they were devoured by the ants.

FARM AND VELD.

Important to Farmers.

The Commercial Agent of the Agricultural Department requests us to announce that a buyer has approached him for a quantity of dried Chicory Roots, and is prepared to pay £12 10s. per ton. Buyers are also wanting Pigs, average weight from 100 lbs. to 150 lbs., price offered 4d. to 4½d. per lb. live weight. Sellers should address "The Commercial Agent, Department of Agriculture, Cape Town."

"Slang Kop"

"W" writing from Phokwani, says:—"When the growing flower stem of "Slang Kop," is plucked out it breaks off right at the bulb—leaving a hole direct to the very vitals of the plant. This filled with "lye" (which the old Boers used in soap-making) will kill the plant absolutely. Other chemical washes, even quick lime, will no doubt act equally well or even better, but this is cheap and otherwise harmless. A lot of kafir maids and half grown children armed with old kettles or such like full of the stuff, marching in extended order through the veld, would clear a large farm of this obnoxious bulb in no time, and the style of work would suit them. Put this first to the proof and improve on it."

Additional Forage and Pasture Plants.

To farmers who are on the lookout for forage and pasture plants, additional to the lucerne, barley, and barley wheat always with us, we would direct attention to the reports of experiments carried on all over the Colony with varying success which are published elsewhere in this issue. This month the reports deal with leguminous crops and the facts disclosed are of exceptional interest indicating as they do the great possibilities opening up of providing artificial feed for stock during the time that the veld is bare.

Bacterial Fertilisers.

Of peculiar interest, too, are the reports received on the effect of treating the seed with bacterial fertilisers, an astonishing fact literally confirming the ironical ridicule of the farmer who, when he first heard of artificial fertilisers, spoke of them as "the stuff you carry in your waistcoat pocket to spread over a morgen of land." The day of the doubter is past but even the believer is lost in wonder.

As no doubt a number of farmers will be desirous of testing for themselves these preparations and as the department is distributing packets of bacteria free, we publish herewith the directions issued with each parcel shewing how it is to be used.

Directions for using Bacterial Fertiliser.

Scald out a small enamelled clean dish with a cover, or a large preserve-jar, and allow to get cold. Take one quart of water which has been boiled and allowed to get quite cold, and dissolve in it the contents of the WHITE PACKET. Pour into the jar and cover with the lid or a piece of clean linen, wrung out of warm water. Then carefully open PACKET OF WOOL and add this to the mixture. Allow to stand in a warm room for 24 hours, then add contents of BLUE PACKET, and allow to rest for another 24 hours. The solution is now cloudy and should be used as soon as possible.

To Inoculate Seed.

Take just enough of the solution to thoroughly moisten the seed. Stir thoroughly so that all the seeds are touched by the solution. Spread out the seeds in a shady place until they are perfectly dry, and plant just as you would untreated seed. If bad weather should prevent planting at once, the inoculated seed, if thoroughly dried, may be kept without deterioration for several weeks. The dry cultures as sent from the laboratory will keep for several months. Do not prepare the liquid culture more than two or three days previous to the time when the seeds are to be treated as the solution once made up must usually be used at the end of forty-eight hours.

To Inoculate Soil.

Take enough dry earth so that the solution will merely moisten it. Mix thoroughly, so that all particles of soil are moistened. Thoroughly mix this earth with four or five times as much, say half a wagon load. Spread this inoculated soil over the land to be sown, and harrow it well in at once.

It is specially requested that when sowing a patch of lucerne, beans or peas, a part be sown with seed not previously treated so as to ascertain whether the use of the Bacterial Fertiliser has had any good effect. The growth of nodules on the roots is indicative in the one case that the inoculation has had the desired result, in the other that the organism was already present naturally in the soil. It is requested that in due course a report of the result be sent to:—The Agricultural Assistant, Department of Agriculture, Cape Town.

Leguminous Crops.

It may also be appropriate at this time to give simple instructions for sowing the crops referred to this month it being hoped that as a result of these experiments many will be induced to go in for them on a large if still experimental scale.

Vetches.

Are suitable for most soils particularly sandy lands. The best sowing seasons are April, May, and again in September, but precise time probably varies from place to place. Vetches are best sown along with an equal or double quantity of oats, barley or rye which give support to the rank growth and prevent it lodging on the ground and turning yellow. Sow at the rate of 6 to 8 bushels of the mixture per morgen, one bushel of vetches weighs about 64 pounds. In about 12 to 14 weeks after sowing, the crop should be ready to cut.

Lupins.

Par excellence, the green manure for poor sandy soils may be sown on old lands and lightly ploughed in or on ploughed land and harrowed in, using 200 pounds of seed per morgen.

Cowpeas.

Several varieties—are much used in the United States as a feed for all sorts of stock, both grazed or cut and fed in stable. The cow pea grows best on deep light porous soils and prefers rich ground. Manuring is not necessary but an application of phosphates and potash is well rewarded. It is reckoned a drought resisting plant. The cow pea is more susceptible to cold and wet than are mealies, and should be sown at the same time as is usual in the district for later mealies, melons or beans, and at least two months before frost is expected. With regard to a seed bed it must be well worked, mellow, smooth, fairly dry and above all things warm. On stubble land or old mealie land a cultivator or disc harrow should prepare the ground sufficiently well. The seed is sown in drills $2\frac{1}{2}$ feet apart at the rate of 1 to 2 bushels per morgen or broadcast 4 bushels per morgen. The crop should be mown for hay when its peas are well formed and the leaves are just beginning to turn yellow. It may be treated like lucerne-hay and stacked or baled loose as desired. Two cuts are often made in the season. The hay is palatable and easily digestible. Seed is generally hand picked, a tedious operation but not heavy work, children can readily do it, and cutting it green for dairy stock is one of the very best ways of using the crop, and grazing it is easily managed. The seed should be buried 1 to 2 inches deep and in light sandy soils even to 3 inches. Cow peas are particularly well suited for green manuring, being ploughed in to enrich and improve the soil.

Crimson Clover.

This annual clover is essentially a green forage or green manuring plant, a quick grower supplying early succulent and nutritious feed. It thrives on light but moist sandy loams and does well under irrigation; indeed it requires abundant moisture and warmth and will not withstand cold and drought well. It may be sown at the rate of 30 pounds per morgen alone or with oats or on the top of the young crop and comes away after the grain crop has been cut as soon as it rains or the land is watered. The young plants are easily killed by hot dry weather. Crimson Clover requires a fine smooth seed bed and should be only lightly harrowed in. It can be sown to advantage after mealies or tobacco. The crops should be cut not later than when it is in full bloom. If fed to horses after this stage it is apt to occasion hairballs in the stomach but an occasional feed will do no harm, and otherwise it is an excellent food.

Sainfoin, Giant and Common.

This is often described as the lucerne of light land on which it grows best if plenty of lime is present; stagnant water it cannot stand. Sainfoin grows somewhat like lucerne to a height of about 18 inches on a slender stalk. It may be treated in every way as lucerne is treated, but at the commencement is usually sown out with a light nurse crop of barley to shelter the tender young plants. Sow 100 pounds of milled seed broadcast per morgen or 8 bushels of rough seed (in the husk). Its chief use is as fattening pasturage for sheep, but it can also be made into hay. Unlike crimson clover, Sainfoin is perennial.

Clovers.

While not approaching lucerne, yet these have their uses and will doubtless take their place in our agriculture for the improvement of pastures, especially of moist vleis and home paddocks where stud stock and young lambs, calves or chicks are kept. It is impossible to over emphasise the necessity for thorough preparation of the ground and for providing a fine seed bed for all clover seeds. Protection in the form of a nurse crop of barley, oats or rye is very desirable during the early stages of growth.

As a rule clovers form only part of a mixture of seeds sown, but as a general guide if sown pure the quantity required is from 25 to 40 pounds per morgen. Giant White Clover, Red Clover, and Alsike Clover are perennial but do not last as long as lucerne under favourable conditions will do.

Seed in Stock for Distribution.

The following is a list of the seed at present in stock for distribution to farmers free for trial.—Paspalum grass, Italian Rye grass, Perennial Rye grass, Timothy grass, Cocksfoot grass, Rescue grass, Hungarian Brome grass, Red Clover, White Clover, Giant White Clover, Alsike Clover, Crimson Clover, Egyptian Clover, Japan Clover, Common Sainfoin, Giant Sainfoin, Yellow Lupins, Sulla, Serradilla, Bird seed, Sunflower, Buckwheat, White Mustard, Chicory, Flax, Egyptian Matafifi Cotton, Sea Island Cotton, Salt-bush, Hungarian Millet, Japan Millet, Pearl Millet, Extra Early Sweet Mealies and American Pop-corn Mealies.

Tobaccos.—Turkish, Cuban, American Long Leaf Gooch, and Conqueror.

In addition to the above the following are under order and any applications for the same will be noted and in due course on arrival despatched :—Virginia Leaf tobacco specially selected to supply a bright leaf viz. : Conqueror, Hester, White Oronoka, Goldfinder, Flannagan and Little Oronoka.

Mealies.—Cinquantino, Pederick Perfected Golden Beauty, and Leaming Improved Mealies, also Snow White Dent. Pride of the North, Waterloo Extra Early, Leaming Early, Thoroughbred White Flint, Wisconsin White Dent, Early Yellow Canada, White Rice, Pop-corn, White Pearl Pop-corn, Champion White Pearl, Dhoura, White Millo, Yellow Millo, Brazilian Flour Corn, Sweet Fodder Corn, Virginia Horse Tooth, Iowa Gold Mine and Iowa Silver Mine.

Sorghums.—Early Amber Sugar Corn, Undendibule Sugar Corn, Jerusalem Corn, Saccharatum, Planter's Friend.

Milletts.—Japanese, Egyptian (Pearl), Siberian, Everlasting (hulpense), White French, Italian, African Early Pearl, Cat-tail (Pearl), Moha, Green Californian, Imphee, Minnesota Amber Can, Early Orange, Japan Barnyard, Red Siberian, and Hungarian.

Vetches.—Spring, Winter and Scotch Gore.

Cowpeas.—White, Bluehill, Green, Browneye, Coffee, Large Lady, Clay, Gourd, Calico, Whip-poor-Will.

Beans.—Scotch Tick and Scotch Horse.

Turnips.—Fosterton Hybrid, Purple Top Mammoth, Green Globe, Imperial and Improved Early.

Mangold.—Golden Tankard, Yellow Globe, Orange Globe, Giant Half Sugar, Giant long red.

Rape.—Essex, Winter and Summer.

Sugar Beet.—Silesian, Imperial, and Klein Wanzlebener.

Kale.—1,000 headed and Hardy Branching.

Swedes.—Monarch, Purple Top and Giant King.

Carrots.—Altringham.

Chicory.—Short Brunswick and Smooth Magdeburg.

Lupins.—White, Blue and Yellow.

Peanuts.—Riga Flax, Manna.

Turkeston Lucerne.—Egyptian Clover.

Pumpkins.—Tours (Citronilla) Green Spanish, Etampes (bright red).

Meadow Grass.—Rescue Grass, Tall Oat Grass, Tall Fescue Grass, Australian Meadow Rice Grass, and Devon Evergreen Rye Grass.

Pests and Penalties.

Mr. Herbert Alston, of Van Wyk's Vlei, writes :—"Two letters in your August number mention a plague of field rats and birds. Some years ago—shortly after the system of paying for jackal tails had effectively diminished the number of these animals—considerable portions of farms to the north were simply denuded of vegetation by field rats, and locally these little animals multiplied excessively, though not with quite such destructive results to the veld as in the more sandy tracts. They are still in force, however, and complaints are coming in of veld destruction. Jackals live largely on field rats, digging them up if necessary, but always getting a supper. An occasional lamb is attacked to vary the menu, in return for which it appears the veld is preserved.

"It may be worth while enquiring of Mr. J. F. Buckley whether jackal destruction in his vicinity has been carried to the point of extermination within the past two years. Other farmers, too, may be able to give us some facts in connection with the increase of hares and minor pests under the stimulus of that benevolent system which is capable of enabling a farmer to pay his quitrent in tails.

"I have some recollection, too, of another tale with regard to certain vineyards of France, wherein the birds took more than was good for them, were exterminated, and then re-imported to destroy the insect pest that for every bird destroyed, arose in thousands. 'Farmer,' writing in the same number, wishes to destroy the birds, presumably exterminate them. May I find space to plead for same? For many years I spared the birds in the garden, until now some six hundred sleep nightly in the trees. Insects and their depredations are unknown in the vegetable garden. Before the birds accumulated, I shared with the worms and beetles, very much the worse for the compulsory partnership. Last year my vines came for the second time into bearing, and as the birds had not divided fairly the previous season, I fell upon them with an air-gun, and in a couple of weeks killed some 400. Then we shared again, and this time the division was fair; better still, the birds are still in sufficient numbers to keep down the caterpillars. If 'Farmer' will kill the *surplus* only, I feel sure he will be rewarded. That the object of my letter may not be misunderstood, I wish to say that it is in intention a plea for the most careful consideration of the probable penalty to be paid for the *extermination* of any created thing, (even the locust should be studied *versus* steekgras and other vegetable plagues) before legislation steps in to enforce it. The destruction of one force simply liberates another. If in our own persons we cannot disturb the balance without paying a penalty to nature, it may be applicable on an uncomfortable scale when we deal with millions, and 'eye for eye,' 'tooth for tooth,' seem very literal should it be exacted by her for the hosts we destroy."

Dairying all the Year Round.

The "hired man" is a problem in Australia, even to the dairyman, and the irregularity of the milking seasons accentuates it; for, as the milkers cannot get full employment the year round, they drift into other occupations. The result is that when most needed they are not available. Discussing this problem in a recent issue of the *Australasian*, "R.D." says the dairy farmers should provide permanent employment for the men by adopting a system of management that will spread the dairying season over the whole year, instead of confining it to a few months. In doing so they will consult their own best interests, and the change will bring about a treatment of their cattle that is less akin to cruelty to animals than the system that is now generally adopted. When compelled to depend on natural pasture alone, dairy cattle undergo alternating periods of abundance and starvation, and their productive powers are handicapped accordingly. In other countries, notably Denmark and Sweden, special crops have to be grown to tide the cattle over a long, cold winter, and it is absolutely

necessary to house the animals for at least six months of the year. In Australia it is exceptional for the cows to be placed under cover even during the coldest nights of winter, and not a great many farmers make provision for feeding them when the pasture becomes scanty or withered." If the consideration of the milkers is eliminated, the conditions are very similar in this Colony.

Encourage the Good Milker.

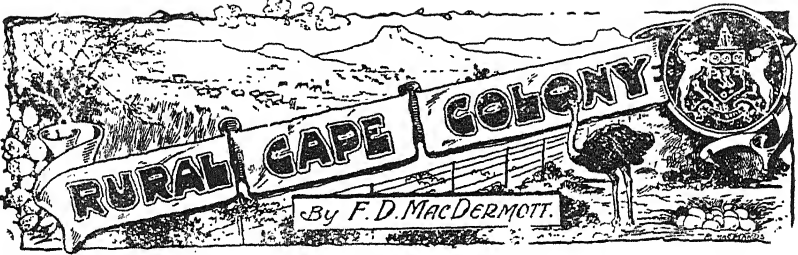
This is not the proper way to carry on dairying, neither does it furnish a means by which dairying can be carried on all the year round. It is little wonder, therefore, (continues "R.D.") that there is trouble with the labour question. The ability to milk a cow properly necessarily means that the workman must be possessed of a considerable amount of skill, which can only be acquired by a good deal of practice. A bad milker may ruin a score of cows in a season. The business of dairying can never be placed on a satisfactory footing until it is carried on the whole year round. To obtain the best results in the important matter of price, there should be no break, or, at all events, a very short one in the output of butter.

Hints on Calf Rearing.

Messrs. R. Wilson, Son & Co., as agents for Messrs. Thorley, write to inform us that they have received a pamphlet on Calf Rearing issued by that firm, which should prove useful to those in the Colony interested in stock rearing. They offer to forward copies to anyone applying for them.

Fustage Sale at Stellenbosch.

Attention is directed to the advertisement in the business portion of the current issue of the sale of fustage at Nooitgedacht, near Koelenhof Siding, on the 19th inst. Full particulars are given.



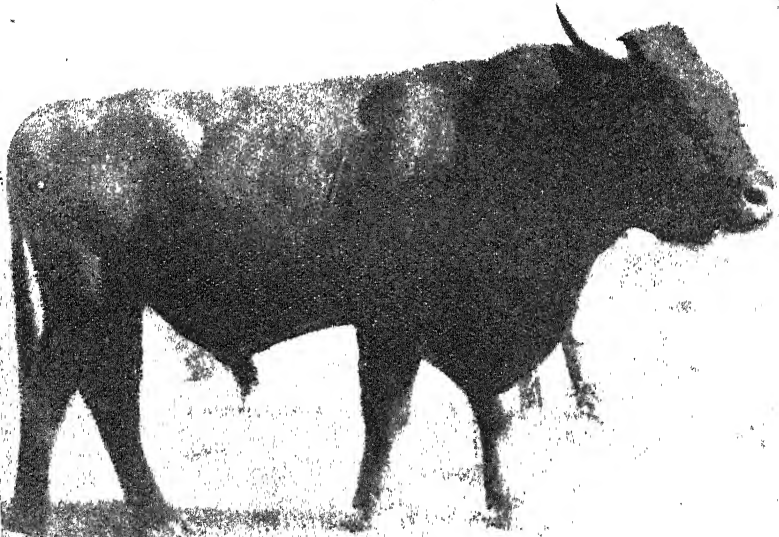
NO. XXI. (*Continued from page 192.*)

THE DISTRICT OF BEDFORD.

After going over the creamery at Bedford, and having a look round that thriving village, I again moved out into the district, and this time proceeded in a more easterly direction, my immediate destination being

THE COWEY VALLEY.

This interesting and picturesque section lies in a rift in the mountains, through which runs the Cowey River, from which it takes its name. The stream is not very large, but does good service to the farmers along its banks where the waters can be diverted. It rises at the upper end of the valley in the forest-clad kloofs, which score the sides of the steep mountains above. Here, again, is to be noticed the bad effects of cutting out the timber, but as most of the hillside land thus cleared has since been brought under cultivation, the evil is somewhat counteracted. For all that, the reduction of the conservation area has reacted with marked effect on the flow of the stream, and on all sides one hears complaints of lengthy droughts and absence of moisture, where some years ago such calamities were unknown. Most of the cultivators in this valley seem keenly alive to the value of water, and most of the natural supplies are jealously conserved. Owing to the peculiar conformation, it is considered quite practicable by many of the more experienced farmers to supplement the existing supplies by constructing earthen dams in the hollows just off the water courses, and turning the flood-waters of the rainy seasons into them for storage purposes. If this could be done on anything approaching an adequate scale, it is safe to assert that there are few spots in South Africa of its size that could be made so productive. The soil is good, and there is plenty of it. Stock of all kinds, both large and



"Burton Boss," imported Red Lincoln Shorthorn Bull at "Cullendale."

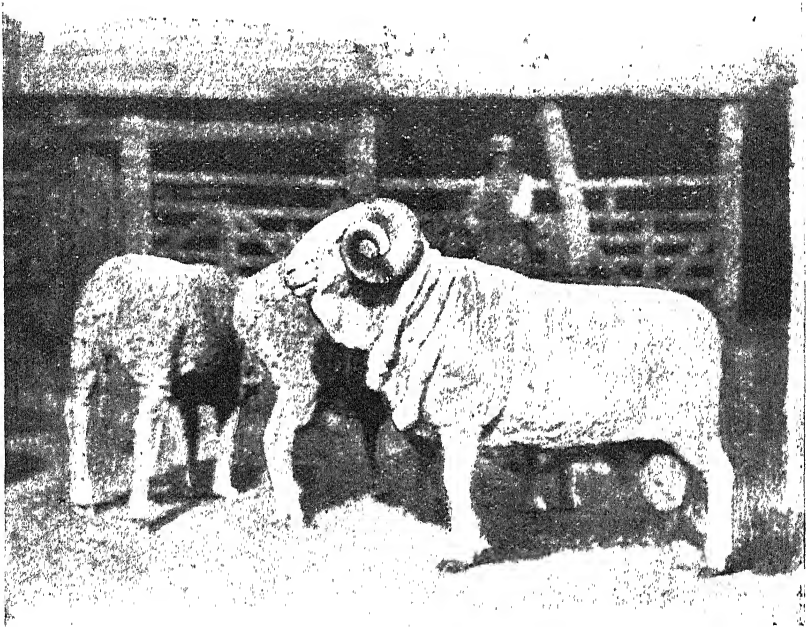


A record mother at "Cullendale."—Colonial bred Shorthorn.

small, seem to do amazingly well, and crops of cereals, mealies, roots, and lucerne give large returns. The hillside lands are mainly devoted to mealies, with cereals and roots on the lower levels and lucerne in the valley bottom, where irrigation is fairly easy. The first farm I visited in the valley was

“CULLENDALE,” THE HOME OF MR. W. H. HOCKLY,

and here I spent a most interesting and entertaining time with its veteran proprietor. Mr. Hockly has filled so prominent a place as a public man for so many years, and is so well known, both in political and farming circles for his thoroughness and devotion to

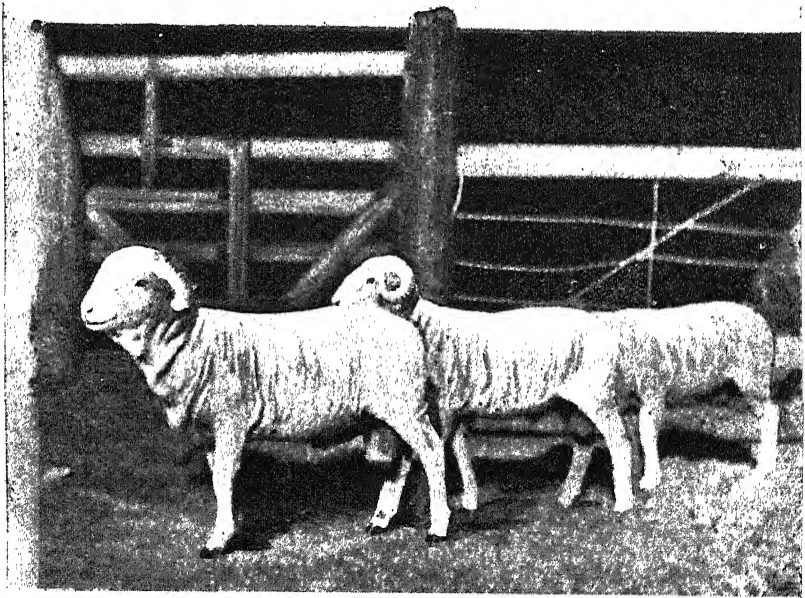


Rambouillet Rams at “Cullendale,” showing colonial bred “Favourite” in front.

the best interests of the country, that it will surprise no one to learn that the farm reflects the man. The homestead itself is beautifully situated, but lays no claims to architectural distinction, having grown with the development of the property. The main buildings form three sides of a quadrangle, and have a business like and solid look about them, which makes up for other deficiencies. The front overlooks a wide stretch of valley land gently sloping down to the river, the foreground being dotted with trees and bush, the cultivated lands, green with lucerne and other crops, stretching along the banks, while in the distance a range of hills which might

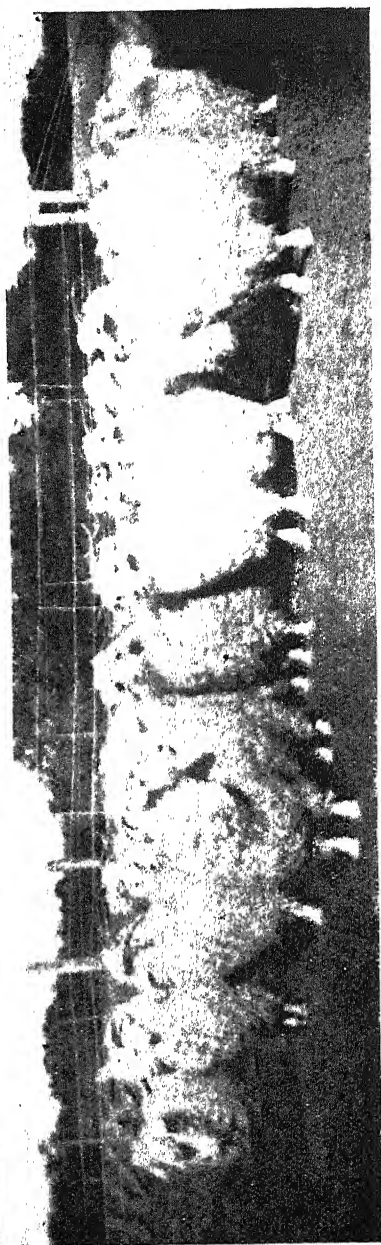
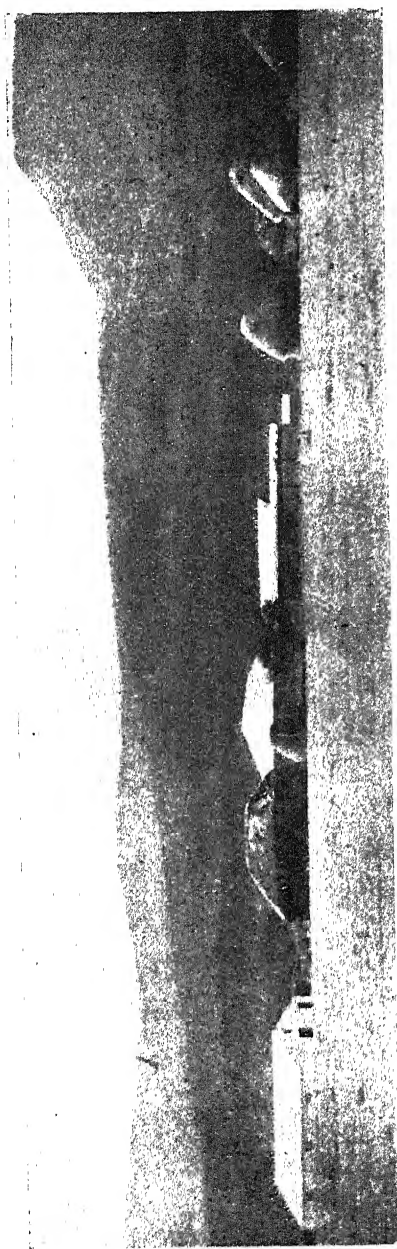
be described as mountains, fairly covered with bushes and grass, completely fills the back ground. Unfortunately, the homestead is so situated that anything like a representative photographic view seemed beyond my ingenuity. Wherever I planted the camera the result seemed the same—always disappointing; so I was compelled, reluctantly, to acknowledge defeat.

"Cullendale" is a grand farm and is a great credit to the owner. In extent it covers some 2,000 morgen of which about a hundred morgen are arable. Long ago the advantages of lucerne were appreciated and some fifty acres—all under irrigation—are devoted to this valuable fodder crop which thrives splendidly here. Large crops of mealies and oats are raised on the farm as well, but the special feature is the stock.

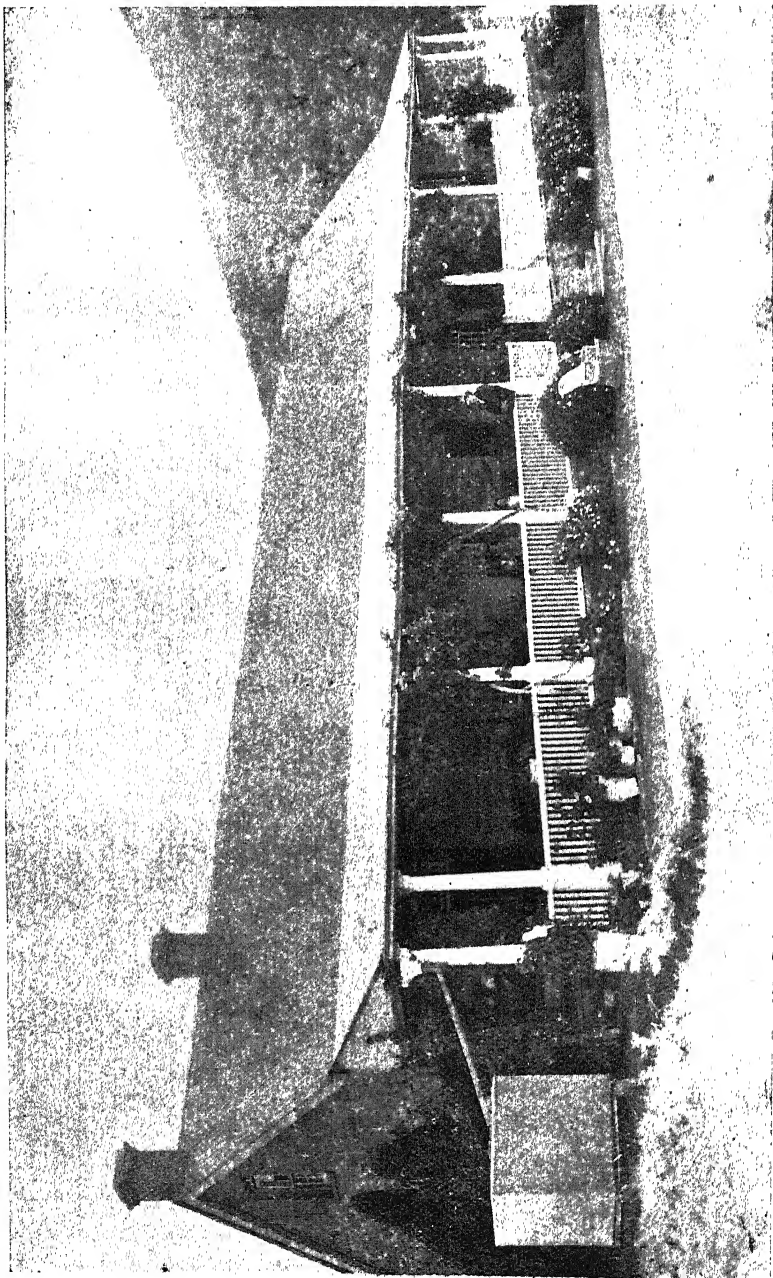


Rambouillet Ram Lambs at "Cullendale."

The main crop is wool and dairy products. Being so close to Bedford the milk supply is run in daily, without much trouble, to the creamery and as there is always plenty of fodder on the farm to keep the milkers going the supply is maintained with fair regularity. One of the most heartening views at "Cullendale," is the fine array of lucerne stacks and barns shewn in one of the photographs herewith. Though it must be admitted that the natural advantages of this property are rather above the average for the production and maintenance of reserves of feeding stuffs it is none the less encouraging to see so good and practical an example set to the



Lucerne Stacks and Barns at "Cullendale," and Mr. C. Webber's Stud Angoras at "Havelock Home."



"Spring Grove," the Homestead of Mr. W. S. Ainslie.

surrounding farmers, some of whom seem still to be convinced of the real profits which are certain to accrue from systematic farming.

The type of cattle bred on the farm is Shorthorn crossed with the Red Lincoln. The herd consists of about 150 head, and among them are some splendid animals. The bull shewn in the illustration herewith is a fine animal imported from the famous herd of Mr. John Evens, of Burton, Lincolnshire, England. His name is Burton Boss, out of Burton Rose by Red Rover. The feature of his pedigree was the fine milking qualities of the dam who held a record of six gallons a day. The cow shewn in the illustration is another fine creature—Colonial bred—and of a good milking strain. For years she has kept her reputation and has three sisters who have earned equally pleasing characters. The whole herd are milkers and this point in their characters is jealously guarded.

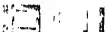
The sheep are all of the Rambouillet type—both imported and Colonial bred—and the shearing shows a respectable output yearly. The season was against the sheep when I was on the farm and the couple of snapshots I obtained shew them all with but a few months' growth of fleece. The flocks are usually sent to the Winterberg for the summer.

The farm is now carried on by Mr. W. Hockly's son, Mr. A. Hockly, and the traditions are being fully maintained with a broad outlook for the future. The younger men of this district are taking a keen interest in the question of vermin proof fencing. On "Cullendale," an excellent object lesson in the modern methods of fencing is to be seen. Of the total of 2,000 morgen about 1,500 morgen are effectively enclosed with a woven fence and though the outlay was costly I was assured it more than repaid for itself. The system of fencing in groups is being tried with more or less success, and "Cullendale" forms part of a large area which is protected in this way. This system seems likely to grow—being encouraged by the support suggested under the various co-operation schemes now before the country—and it will be interesting to those who contemplate adopting it to learn that it is found to work fairly well. The one obvious trouble where large areas are enclosed would be that of careful supervision. It is quite possible for a little oversight on the part of one or the other of the parties concerned to cause trouble to others in the area. A break in the fence may let in a depredator, but it can soon be located if a good system of supervision—say in the form of organised boundary-riding—were introduced. For this to prove complete and effective, the boundary-riding would have to be shared regularly and include the whole of the outer fences of the group. However the system is comparatively young as yet and those who take it up will no doubt provide practical measures to assure its success in working.

"SPRING GROVE," AND THE UPPER PART OF THE VALLEY.

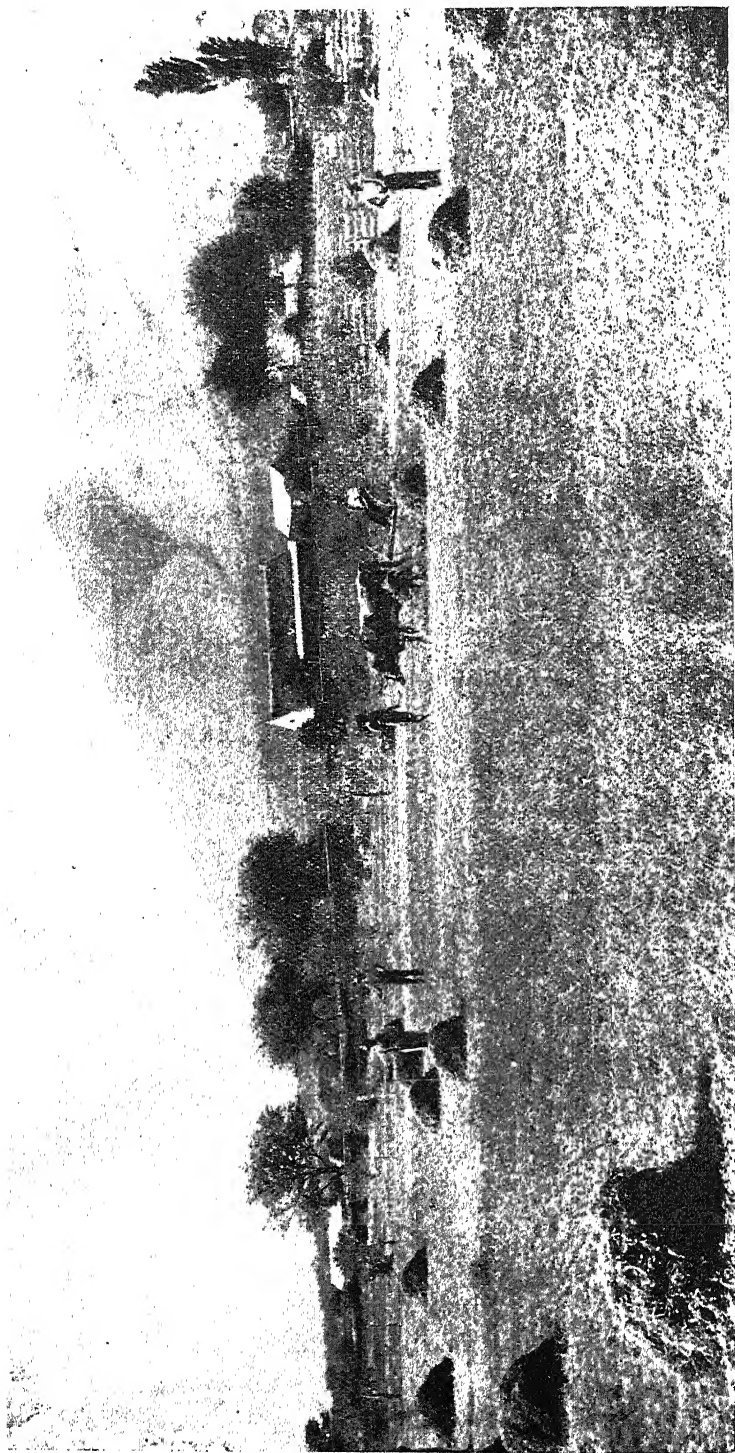
I have mentioned that this beautiful valley runs back some miles into the hills, and while at "Cullendale," I had the pleasure of a drive to one of the upper farms--"Spring Grove." As we drove through the valley Mr. Hockly, senr., pointed out most of the special features including the farms "Cavers," owned by the Rosses, a splendid agricultural property, on the upper levels; "Donkerhoek" owned by Mr. W. Ainslie, also largely an agricultural proposition; and away below "Cullendale," the farm "Rockwood," owned by Mr. F. Ainslie. Our journey ended at "Spring Grove," that day, and we stayed there for a couple of hours going over some of the more interesting features of the property. Mr. Ainslie's energies are devoted mainly to cereals and cattle, and he is one of the small but rapidly increasing group of farmers who are taking an interest in experimental crops and grasses. In the bottom lands he has a nice stretch of irrigated land which is gradually being brought under lucerne, and, a little higher up, a grove of seedling orange trees and a small orchard. He has laid out another small orchard a little further back which he is working on the dry system of cultivation and it seems to be doing fairly well in spite of the scarcity of rain which has affected the district for so long. Oranges have done very well here until lately, but they are now beginning to show signs of decadence. They were originally planted somewhat irregularly and rather close together for seedlings; the result is that they are over-growing each other but with careful handling there is every prospect of their recovering their old vigour once more. Mr. Ainslie assured me that his crop of oranges has gone as high as 180,000 marketable fruits from the sixty trees—a return which should encourage any cultivator. Trees are plentiful on this farm, and the situation is very pleasing. On another page a view is given of the front of the substantial, stone-built homestead with some members of the family on the stoep.

ANGORAS AT "HAVELOCK HOME."

In traversing a district like this it is impossible not to be compelled to make some hurried snatch calls and my visit to "Havelock Home," at Wortel Drift, the homestead of Mr. C. Webber, was one of these. Fortunately, while there, I was able to secure a photograph of a flock of Angoras which shews what is being done in this class of small stock in the district. The group on another page speaks for itself, and Mr. Webber is to be congratulated on the possession of a stud flock which shews up so well. Mr. Webber has not been long on this property and is busily engaged with developing works which include a great deal of vermin-proof fencing and others of some magnitude. With characteristic energy and perseverance he is pushing ahead and the near future should shew a great difference in the property. 



"Glen Thorn," with Oaks, Orchard and Lucerne Field in the foreground.



Making Lucerne Hay at "Thorndale."

THE MANCAZANA VALLEY.

In my peregrinations eastward, I managed to get as far as the Mancazana impinging on Adelaide, and was well repaid for my trouble. A magnificent view of the surrounding country is obtained during the drive from Bedford, including a glimpse of the town of Adelaide and the Koonap Heights in the far distance. The Mancazana Valley takes its name from the river that winds its picturesque way through it, varied by bush clad slopes and fertile bottom lands showing every indication of the vast possibilities that lie before this part of the country in the future. Just beyond the point where the road turns out from that leading to Adelaide one enters the valley by crossing the river. Here the principal feature seems to be a very deep-red soil which should give good returns to the farmer, and, judging by the extent of the cultivated lands, its value is appreciated. Further on as the country rises—which it does rather rapidly—the soil changes to a darker colour, and so continues until the valley merges into the lower stretches of the foothills of the Winterberg, where it thins out and the veld becomes sour. But that is some hours' driving from the point mentioned above. Among the more important places I called at during my hasty run through this section were two owned by another branch of the Pringle family.

“GLEN THORN” AND “THORNDALE,”

now worked by a younger generation of the family, as the firm of Pringle Bros., are justly celebrated in the district for the enterprise of the proprietors. Mr. R. P. Pringle, the father, is also on the property, but he leaves the farm work now to his sons. The photographs herewith give a good general idea of the picturesque situation of these properties, also the general direction of the farming operations. Stock is the main feature, represented practically by cattle and merino sheep. The buildings on both farms are substantial and roomy, with plenty of shelter for the stock, while the cultivation is nearly all made subservient to the doctrine of sending the crops to market in the form of animal products. Certain classes of trees thrive well in this sheltered valley, including oaks, but the latter are beginning to fail here and there. Fruit, too, has done fairly well in the past, including apples, oranges, and walnuts. The orange groves, however, are not thriving well now, though strenuous efforts have been made to restore them to their earlier condition.

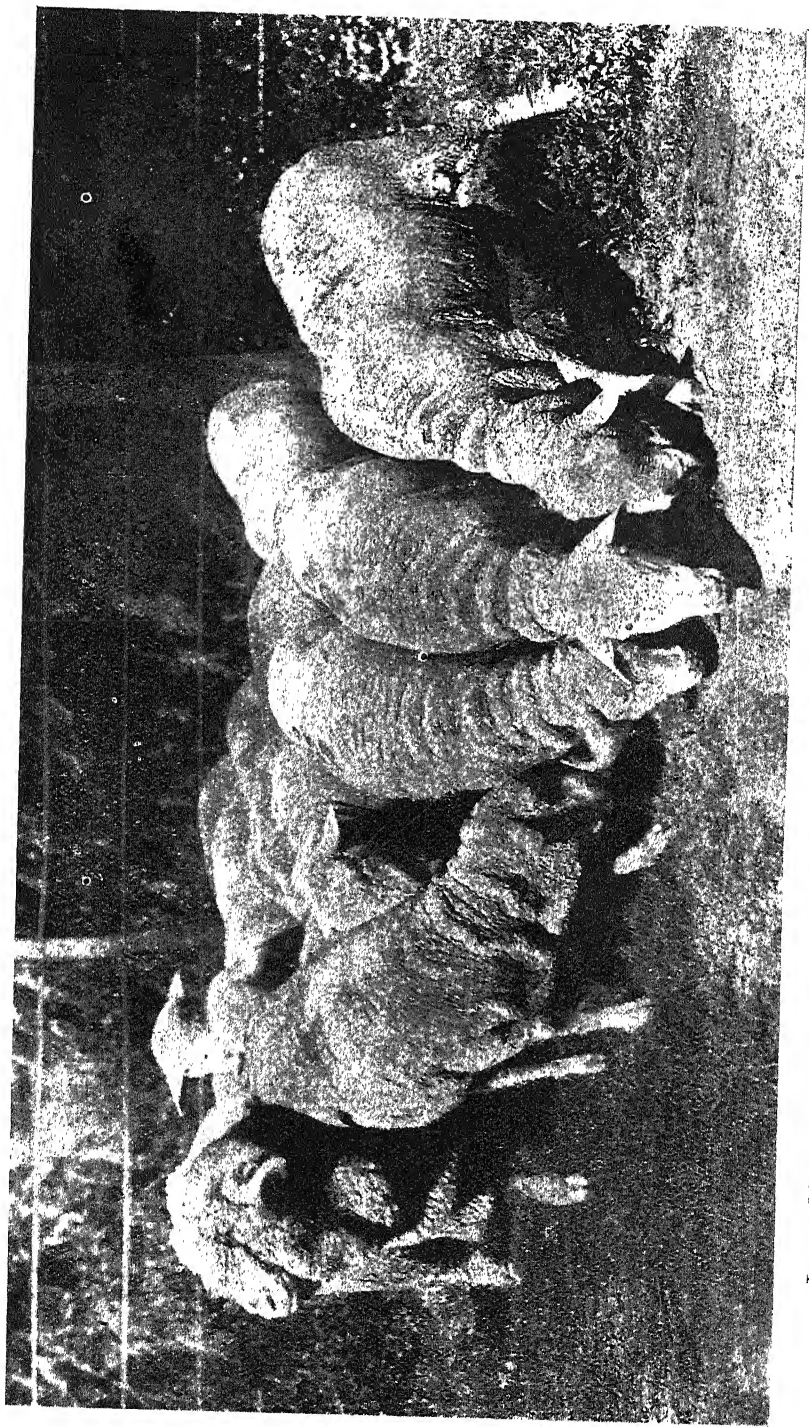
Lucerne gives a large return, and its cultivation is being extended as fast as the lands can be brought under irrigation. This crop has a great future before it hereabouts, for the soil and the conditions are eminently suitable in the valley bottoms, where water is available. Both at “Thorndale” and “Glen Thorn” large extents of the arable land are devoted to its production.

Stud sheep has been a feature of these properties for some years past, an excellent flock of high-class Rambouillets having been established. Some while back the district could not be brought to see the advantage of public sales of breeding stock, and it was left to the Pringles of "Glen Thorn" to initiate the system. To shew how thoroughly they work, it may be here mentioned that they started by holding ram sales on the farm, and the pens they erected for that purpose are still extant and in good order. Now, of course, it is unnecessary to do these things, as regular quarterly ram sales are one of the institutions of Bedford.

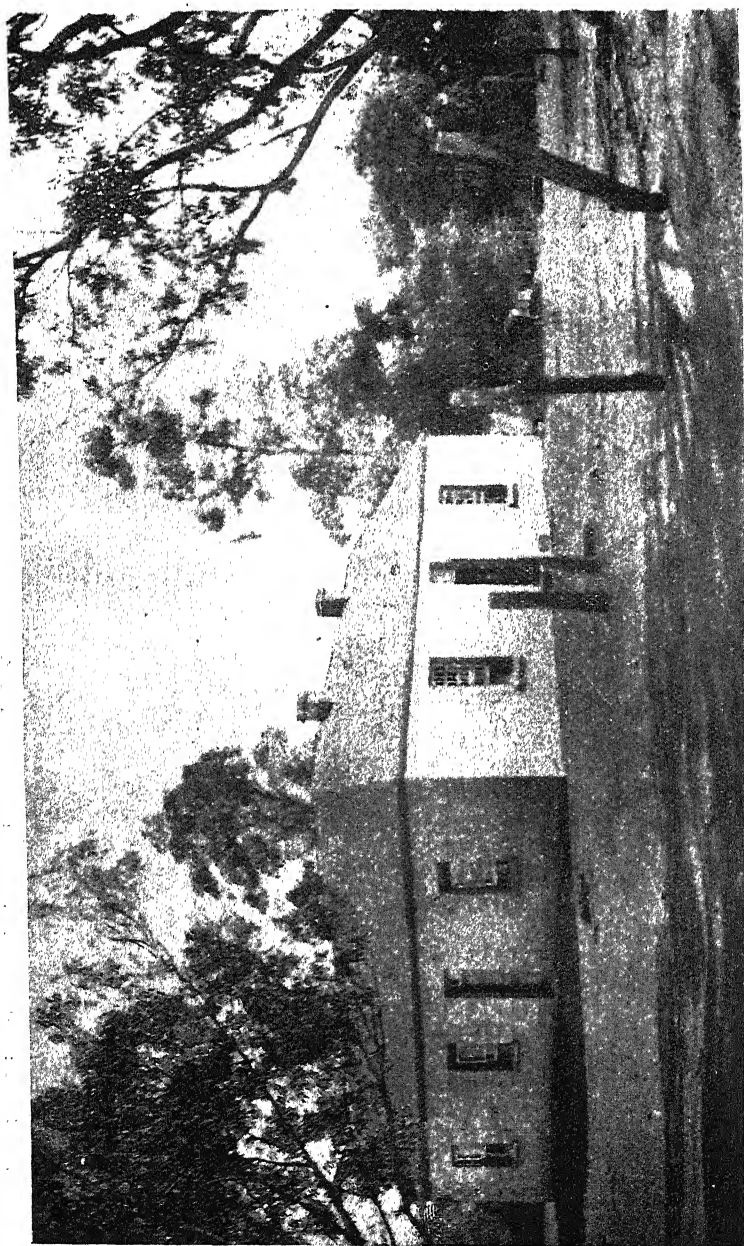


Afrikaner Bull "Mystery" at "Thorndale," the property of Messrs. Pringle Bros.

A very fine herd of Afrikaner cattle is another feature of these properties which at once attracts attention. Those who know anything intimately of the history of these parts are aware that one of the elder Pringles—the late W. S. Pringle of Eildon—built up one of the finest herds of Afrikanders in the Eastern Province, but these were mostly dispersed at his death, and the herd has since lost most of the characteristics which made its reputation. But, so far as I could gather, some at least of the "Glen Thorn" herd are descended from the original "Eildon" stock. The bull "Mystery," whose photograph is shewn herewith, is supposed to be of this strain, and as he has strongly marked characteristics, there seems little room to doubt this statement. There are some good milkers in the herd.



Imported Rambouillet Merino Ram and Colonial Bred Ewes at "Glen Thorn," the property of Messrs. Pringle Bros.



"King's Vale," the Homestead of Mr. T. W. King.

Being right in the mountains, these properties are subject to the depredations of the jackal, and as a consequence the use of vermin-proof fencing has "caught on" with the younger men. It is a difficult country to work in, being so steep and broken, but, notwithstanding, several miles of woven fencing have been constructed which has proved a valuable safeguard for the small stock. The Kitseluan weaving machine is used, and in some places the whole outfit, wire and all, has to be transported on the backs of horses. These difficulties, however, are thought little of compared with the advantages gained by the system.



Mr. T. W. King's Stud Ram "Cap." Weight of fleece 30 lbs. at 13 months growth, bred by J. H. King, Highland Home, Tarkastad.

As space is running short this month, I must now leave the Mancazana. I have some further notes on this interesting section, with photos, which shall be continued next issue.

"KINGSDALE," THE HOME OF MR. T. W. KING.

The King family fills a large space in the farming records of the Bedford District, having been settled there for a couple of generations. It would be impossible therefore to be in the district without seeing something of one or other members of the family.

I may say at once that I saw a good deal of these noted stock-breeders, and learned much of interest from them, but have not space in this issue to do justice to it all. I must content myself here by mentioning my call on Mr. T. W. King at "Kingsvale," and was deeply interested on looking over the farm, particularly in the excellent Merino sheep. The homestead is quaintly situated in the shadow of a grove of timber, and water is conserved in a large dam not very far above. Further efforts in the shape of water



Mr. T. W. King's Stud Ram "Rex. Weight of fleece 31 lbs. at 12 months. Bred by J. H. King of Highland Home, Tarkastad. Champion Queenstown, 1906.

conservation are being made in the shape of another large earthen dam, which, it is hoped, will greatly increase the capacity of the property. With the continued droughts which have afflicted the district, the water question, particularly on these lower-lying farms along the Kaga, is becoming quite a serious proposition. With regular rains, it would be impossible to imagine a finer stock country.

Next month more about Mancazana, and the farms of Messrs. Geo. King & Sons.

CO-OPERATION IN AGRICULTURE.

Extracts from the Report of Mr. P. J. Hannon,
Superintendent of Agricultural Co-operation.

The Superintendent of Agricultural Co-operation, Mr. P. J. Hannon, has issued his report on the whole question of organizing the work of the producers in this Colony, which has been published as a Bluebook, but as farmers are not, as a rule, given to this form of literature, we reproduce for their information some of the more salient features, and propose to make further extracts in a later issue.

At the outset Mr. Hannon states: Experience everywhere has shewn that agricultural prosperity can only be strengthened and maintained where the farmer is taught to depend upon himself, and hence agricultural co-operation must begin with the people, and can only be of real benefit in a measure proportionate to the amount of self-help manifested by the producers themselves.

I may perhaps summarise the difficulties with which agriculture has had to contend almost everywhere.

- (1) The well-known conservatism, almost universal among farmers, characterized by a perhaps natural antipathy to violent economic changes and an attachment to the methods of those who preceded them.
- (2) The want of capital for purposes of improvement and development.
- (3) The somewhat necessary isolation of the farmer with reference to the spread of general knowledge, but more especially the educational deficiencies as to technical training in scientific methods naturally incidental to the growth of a more vigorous industrial life.
- (4) The obvious obstacles which present themselves in bringing together persons of different views for the common purpose of improving general social and economic conditions.
- (5) The disadvantages due to want of business experience and unavoidable ignorance of the commercial conditions which govern the transfer and sale of farm produce.

The peculiar position of Agriculture in national economics is set forth, in my opinion, admirably in the following extract from

one of the earlier reports of the Irish Agricultural Organisation Society:—

“There are several special drawbacks in agricultural industry, which are practically unknown in any other sphere of modern human activity. The work of farmers is done apart, not in close companionship with each other; farming business is much more complicated than any other kind of business, comprising, in fact, a regular series of businesses of many varieties, and always dependent on absolutely uncontrollable external phenomena; farming work cannot be performed, as a rule, in a strictly regulated manner; generally speaking, agriculture is much less independent of natural forces and actual circumstances, than any other human work.

“The conclusion is obvious. The agricultural industry of every nation and age has been unable to follow the paths of progress as quickly as any other industry, and so has been entitled always and in every country to the good-will and interference of the community far more than any other industry.”

POSSIBILITIES IN THE CAPE COLONY.

The most striking fact which confronts one in connection with Cape agriculture is the enormous volume of imported food-stuffs, which, clearly, with improved organization, could be supplied within the Colony itself, and the earlier work of the movement must therefore be directed towards bringing the possibilities of the Cape farmer into play in sustaining our own population. This curious anomaly is not by any means peculiar to Cape Colony. In the gradual growth of the economic forces now at work in the other great British Colonies, a point of time can always be marked out when the people were dependent, for some proportion at least, of their food, upon foreign sources, and in the attempt to make these Colonies self-supporting, we have the example of various other communities now phenomenally successful in agricultural export which were, once, themselves importers. The rapidity with which agricultural industry responds to the influence of vigorous, well-conceived organization, may best be exemplified in the case of Canada. The agricultural export of the entire Dominion in 1892 reached not quite four-and-a-half millions sterling, whereas in 1905 it exceeded twenty-one millions of pounds sterling, and this notwithstanding that the Canadian farmer is snow-bound for at least three months in the year. Self-help, on the part of the farmer, combined with well devised practical schemes of education, experiment and subsidy, on the part of the Government, may at once be pointed to as the primary factors in this magnificent measure of success.

After a careful and fairly exhaustive examination of the conditions in this Colony, I am satisfied that co-operation may be

applied successfully to nearly every department of the farming industry. The success of its application, however, must necessarily depend on the enthusiasm with which the whole people take up such projects as may commend themselves in particular districts having regard to local circumstances. During the tour of the Minister and myself, abundant evidence was forthcoming of the desire of the farmers of the Colony to undertake practical schemes in a truly self-help spirit, and it is to be earnestly hoped that this praiseworthy anxiety to make progress may be maintained as projects are gradually brought into operation. The danger perhaps with most new movements is, that while they are taken up with much enthusiasm at the out-set, there may be, subsequently, especially in the face of unavoidable difficulties, a certain re-action which may be attended with serious results. With the experience of the other Colonies before us there is some good reason to anticipate that temporary difficulties will not be instrumental in staying the development which is bound to result from thoughtful and business-like undertakings on the part of our South African people.

VITICULTURE.

The first phase of Cape farming which demands special attention is viticulture. The system of producing grapes for wine-making and the subsequent fermentation and maturing of the wines themselves are, on the whole, with, of course, certain striking exceptions, unsatisfactory. In the production of wine for sale, as indeed in the production of every other article upon which the farmer has to depend for his livelihood, the unvarying fundamentals of real success are a high standard of quality and uniformity. Individual producers of Cape wines no doubt turn out an article of very high quality, but varying, more or less, with reference to one another, without any general recognized uniformity which may distinguish Cape wines of a particular brand as a whole as is the case with well-known brands of other wine-producing countries.

The introduction of co-operative methods may secure, in the first instance, that the farmers' grapes in a particular district will be dealt with as a whole, and will be treated during the process of fermentation and maturing with constant regard to the most modern scientific methods. A co-operative winery aims at providing the most modern equipment, under the management of persons whose skill and knowledge are worthy of the confidence of the farmer. In all the wine producing districts the co-operative winery is not merely possible, but absolutely necessary, and it is encouraging to report that in several cases local interest has been aroused, and there is every probability of several co-operative societies, for this special purpose, being created in a comparatively

short time. In the period embraced by this report two such wineries have been completed, and five or six other districts are considering the proposal to imitate their laudable example. The conditions imposed by Government, and which, it may be said, are appreciated by the farmers themselves, are: before proceeding with the organization of a winery sufficient grapes shall be guaranteed by the would-be members to ensure the business success of the proposal; that a nominal share capital, equivalent to the estimated cost of the concern, must be provided by the members; that absolute title must be secured of an area of land sufficient for the purposes of the society; a first mortgage bond must be made over to Government as security for such advances as may be made. The plans and specifications for the buildings and the arrangement of the plant must be sanctioned by the Government and the person to whom the management is entrusted must be one of whom Government may approve. It is clearly understood from the outset that public moneys are only advanced for the purpose of buildings and equipment, and no loans may be negotiated against wines in cellar. Any working capital required for the purpose of making payment to farmers against grapes delivered must be provided for by the society itself, through its bankers or otherwise. The conditions under which loans are advanced to these and other co-operative societies, the model memorandum and articles of association provided for their working together in connection with practical schemes, will be supplied on application to the Department.

THE DAIRYING INDUSTRY.

The urgency of dealing in some comprehensive way with the organization of dairying will be apparent from the following statistics for the years 1904 and 1905, with reference to the import of dairy produce:—

		1903.	1904.	1905.
Butter	...	£339,400	£249,069	£267,635
Cheese	...	111,166	117,601	88,134
Preserved Milk	...	276,991	279,814	231,522
		<hr/>	<hr/>	<hr/>
		£727,557	£646,484	£587,291

In the three years the total import of dairy produce reached the huge sum of £1,961,332. The volume of this import is of very serious moment to the farmers of the Colony, and it is a sad reflection upon existing conditions that the population of the Cape must be supplied with their butter, cheese, and milk from Australia and the Argentine, with considerable profit to the farmers of those countries, and obviously at the expense of our own farmers. In Australia and the Argentine the dairy industry has been developed through the formation in the first instance of co-operative societies,

these, in their turn, establishing powerful federations to deal with the export of their products. In both countries the breeding of dairy cattle has been specially attended to. The keeping of milch cows entirely for milk production has been adopted with much profit. The treatment of milk and cream has been reduced to a fine art on most farms, and up-to-date creameries with the most complete equipment for the manufacture of a superior article have been constructed at every suitable centre. Railways have assisted by providing cold storage trucks, and were enabled to convey dairy produce at a comparatively low rate in consequence of the large volume produced. These changes have taken some years to effect, but in the Argentine especially the readiness with which the farmers adapted themselves to dairy farming as against the former system of producing beef is really remarkable. The difficulties experienced in the export of cattle to British markets at once forced the Argentine farmer to undertake butter making, and in the course of a few years an immense number of creameries have been erected, the production of which is now a serious competing factor in Great Britain, not merely with the butter of our other Colonies, but with that of the British farmer himself. It need not be expected that a revolution in farming methods may be brought about in this Colony in a very brief time, but the conviction should be borne upon every South African that dairy farming, on proper lines, will undoubtedly be one of the paying branches of agriculture in the future. As soon as farmers realize that the keeping of milch cows, bred and maintained with a special view to the largest possible milk production, is undoubtedly highly remunerative, then will dairying be an assured success. In consequence of the introduction of scientific methods, the farmers, whose butter now feeds our Colonial people, are able to sell at an average price of 10d. all the year round, and at the same time make a large net profit per cow. The Cape farmer, with fewer *milch* cows and with very much smaller volume of milk, cannot, of course, at present, afford to produce butter at this price; but if dairying, on the basis of milk production combined with calf-rearing, were once introduced as is the case elsewhere, the relatively smaller profit on a much larger turnover would more than be repaid even in the face of reduced market prices.

STATE AID TO DAIRYING IN CANADA.

The importance of the dairying industry in most of the British colonies has already been referred to, and the phenomenal growth of the output of dairy produce in Canada and the Australian Colonies is one of the most remarkable developments in modern agriculture. As an indication of the extent to which the Canadian Government, for example, has gone in the direction of fostering the dairying industry, the following regulations with reference to advances of money for the erection of creameries, will

be of much interest to farmers in this Colony. The Canadian Agricultural Commissioner, on the 19th October, 1896, issued the following regulations :—

1. A loan of a sum sufficient to provide the equipment for a creamery, or creameries, or skinning stations, may be made to a Joint Stock Company of farmers, or a butter and cheese manufacturing Association.

- (a) The Company, or butter and cheese manufacturing Association, shall be duly incorporated and registered.
- (b) The Company, or Association, shall provide suitable buildings and premises and a sufficient water supply.
- (c) The buildings shall be erected and equipped according to plans approved by the Department of Agriculture.
- (d) The milk from at least 400 cows shall be guaranteed by the Company or Association.
- (e) The creamery shall be located on a site and at a place approved by the Department of Agriculture.

2. The Government shall undertake the management of the creameries, for the equipment of which these loans are made, and shall manufacture and market the butter, for the account of the patrons, at a charge of two pence per pound of butter.

3. The Government shall pay advances to patrons, after the end of every month, such sums as the Agricultural and Dairy Commissioner may estimate to be about two-thirds of the net value of the milk and cream supplied by them severally.

The advance payments shall be made in even dollars, and no advance payment shall be made for less than two dollars.

4. The Government shall charge a rate of not less than one half-penny per pound of butter, in addition to the charge for manufacturing and marketing ; and the revenue from that rate shall be placed to the credit of a Loan Fund, and applied, in such manner as the Minister of Agriculture may arrange, (1) to the repayment of the loan from the Government and (2) to the payment of any debts which may be due on the buildings and premises.

5. The Government shall continue to control the manufacturing and marketing of the butter at each creamery for a period of at least three years, unless the loan be repaid sooner, and the Joint Stock Company, or the butter and cheese manufacturing Association, gives intimation that it desires to assume control.

6. The Government will pay annually as rent for the use of the buildings and premises, a sum not exceeding 7 per cent of their value.

7. When the repayment of the loan in full is accomplished, the equipment of the creamery may be vested in the Joint Stock Company, or the butter and cheese manufacturing Association in return for the issuing of paid-up shares to the patrons in the

Company, or Association, in proportion to the amounts paid in by them severally to the credit of the Loan Fund.

The action of the Canadian Government is valuable as an example of State aid to the dairying industry, but it will be noted that the scheme of the Cape Government is much more favourable and, from a co-operative point of view, much to be preferred.

AGRICULTURAL CREDIT.

The organisation of agricultural credit on the basis of what are popularly called "agricultural banks," or "land banks," and which has been at the very root of successful agricultural co-operation in all European countries, can hardly, perhaps, be brought into play in this Colony at present. The small tenant occupier or *petit propriétaire* so universal in Europe is practically unknown in this Colony, and the agricultural credit system, which has saved whole communities in Europe, can never be applicable in the same way. The paralysing influence of the usurer, which so sorely oppressed the agricultural population throughout Europe, is not, perhaps, in evidence in South Africa; but it must, nevertheless, be admitted that the farmer, especially in times of difficulty, is obliged to borrow money for the maintenance of his industry under conditions which leave much to be desired. During my tour through the Colony cases were continually being cited of abnormal interest being charged for loans; and, worse still, in many up-country districts, one finds a ruinous system of barter, in which the necessaries of the rural home are provided in exchange for the produce of the farm, after a fashion which weighs heavily upon the farmer and his family. This, no doubt, will disappear more and more with the spread of education and the constant incitement in the mind of the agriculturist of self-respect and self confidence. In my opinion it is the proper and legitimate function of Government to assist the farmer in achieving a position independent of the money-lender and peddling speculator; and I am confident that, in any instance, where a body of agriculturists feel that they are oppressed in the manner indicated, the State will be only too willing to come to their assistance in creating, on sound business principles, facilities for providing loans on easy terms, on the joint and mutual responsibility of those who are themselves anxious to eliminate unjust dealings from the life of the country.

CO-OPERATIVE ABATTOIRS.

During my recent visit to England I gave considerable attention to the application of co-operation to the purchase of slaughter stock and the distribution of meat. It will, of course, be at once understood how different conditions are in England as contrasted with this Colony. The facilities which exist in most cases to acquire the necessary supplies

of slaughter stock within reasonable limits are, of course, much more favourable in Great Britain than here, and the investigation of the management of English butcheries can only serve as a rough indication of what organisation may possibly accomplish in Cape Colony. I went thoroughly into the cost of construction, maintenance, and general business system of the following co-operative butcheries, which are perhaps the best examples which may be quoted in dealing with the application of co-operation to this particular branch of trade. Special instructions were issued by the Co-operative Union at Manchester that I was to receive every information from the Societies I was enabled to visit, and, being formerly a member of the Board of the British Co-operative Union myself, I am enabled to give figures and statistics from the actual books and accounts kept. The Co-operative butchery at Middlesbrough, Durham, was originally erected at a cost of £5,759 5s. 2d., and its further expenses for property and fixed stock up to the 31st of last December amount to £1,014 14s. 8d., making the total cost of erection and equipment £6,773 10s. 10d. It is necessary to point out that the property is situate in a most populous area, and the cost of acquiring a site and discharging claims incident to rights of way and inconvenience caused to other property holdings in the neighbourhood was abnormally high. In rough figures, the machinery and cold storage plant amounted to £2,500, the balance being expended upon the buildings and site. The annual purchases of cattle, sheep, and pigs amount roughly to £35,000 per annum, and the total sales of meat, the whole of which is disposed of to the branch shops of the Middlesbrough Co-operative Society, to £43,000. The actual figures for the quarter ending 31st December, 1905, are as follows:—Purchase of cattle, sheep, and pigs, £8,716 7s. 6d.; amount paid in wages, £616 3s. 2d.; amount paid for expenses of distributing, other than wages, £449 6s. 7d. The animals killed realised £10,787 9s. 1d. for meat and meat products and £815 16s. 7d. for offal, the net profit being £1,620 6s. 2d. The cost in wages for slaughter of meat was 13·71 pence per £ of turn-over, and 10d. for distribution per £ of turnover. The gross profit was 60·69 pence per £ turn-over, and the net profit 36·98 pence. Thus the co-operative society made a net profit of almost 3s. 1d. in the £ on its turn-over, in addition to selling its meat to its members at prices on a level with home-produced meat sold in the ordinary butcher shops. The manager of the abattoir acts as stock buyer for his society, and the expenses thus incurred are included in the figures given. It was impossible to ascertain the exact working expenses of the abattoir, taken apart from the other branches, as many of the employees take part in the sales of the meat and assist from time to time in the work of the slaughter houses. Taking this concern as a whole, it will be seen that the working expenses are slightly less than 10 per cent., the gross profits amounting to 25 per cent.,

leaving a net 15 per cent. on the turn-over to the advantage of the co-operative society.

The new butchery of the Stockton Co-operative Society has only recently been completed, and I was accompanied when there by the machinery contractor, who, by the way, is a specialist in the erection of abattoirs. The estimated cost of machinery and cold storage is roughly £4,000—but this figure cannot be very accurately ascertained, as a portion only of the building is occupied by the abattoir. The machinery cost a little over £1,500. During the week of my visit the killings were 88 cattle, 240 sheep, and 120 pigs; the average daily killings for the preceding quarter's working averaging 22 cattle, 60 sheep, and 30 pigs daily. Eight men are employed, namely, a foreman butcher, who receives 32s. per week, and seven assistants, paid at 30s. per week. The expenses of slaughter and distribution for the three months ending 31st December, 1905, was £569 10s. 4d.; the total amount, during the same period, paid for the purchase and slaughter of animals, including carriage, was £7,123 13s., and the total amount received for meat and offal was £8,583 2s. 10d. The gross profit on each £ of turn-over was 4s. 0½d., and the net profit 2s. 8¼d. The actual cost per £ of dealing with the slaughter and distribution of meat at Stockton was 1s. 5¼d. per £ of turn-over, inclusive of everything.

The Peterborough Co-operative Society's slaughter house cost, for erection and equipment, £3,206 11s. 7d. For the quarter ending 31st December, 1905, the purchases of live-stock were £8,977 3s. 8d., and the sales of meat, including stock in hand, £11,016 1s. 6d. The annual trade would, therefore, in rough figures be £36,000 purchases and £44,000 sales. The cost of management and distribution for this quarter in this abattoir was £620 9s. 7d., or 1s. 5¾d. per £ of turn-over, the net profit being at the rate of 2s. 3¾d. per £. As an example of the accuracy of detail observed in the management of this co-operative abattoir, I append the following table:—

Wages	...	...	£144	6	0
Proportion of salaries	...	...	9	7	0
Proportion of rents	...	...	1	4	0
Rates and taxes	...	...	37	10	10
Insurance	...	...	2	10	4
Repairs	...	...	43	15	10
Lighting	...	...	13	13	2
Water	...	...	2	2	8
Printing, etc.	...	...	10	12	7
Stock-taking	...	...	0	11	0
Smith work	...	...	4	17	4
Harness	...	...	2	12	0
Cart hire	...	...	3	3	0
Coal, etc.	...	...	9	10	1

Petty cash	...	...	...	£3	14	7
Incidental	...	...	...	3	10	0
Horse-keep	...	...	...	31	10	8
				£624	11	1

The Long Eaton Co-operative Society has erected a slaughter house at a cost of £2,200 5s. 2d., including buildings and machinery. For the half-year ending 1st December the purchases of live-stock amounted to £9,757 17s. 7d. and the sales to £11,792 5s. 6d. The gross profit per £ of turn-over was 3s. 4½d.; the cost of slaughter and distribution 2s. per £, thus leaving a net profit of 1s. 4½d. per £. This abattoir is the smallest of those I inspected, but is, nevertheless, doing a very satisfactory and profitable business.

The largest co-operative butchering business in England is that carried on by the Leeds Society. The total purchases of live-stock for the last half-year of 1905 was £76,180 5s., and the total sales of meat £93,290 0s. 3d. The expenses of slaughter and distribution amounted to £6,351 8s. 8d., and the net profit realised to £10,738 5s. 10d. The working expenses were slightly under 7 per cent., and the net profit almost 12 per cent. on turn-over. The operations of the Leeds Society are, however, on too large a scale to afford any useful criterion on what would be possible in the present condition of this Colony, and for the purpose of any schemes which may be contemplated, those previously dealt with will be much more useful.

The Manager of the Leeds Society writes as follows:—

"I beg to say that our purchases of cattle are principally made in our own local markets. We also deal, however, with many farmers and feeders direct. We have a central abattoir, where all our live-stock is killed, and from whence the meat is despatched by our own conveyances to the various retail branches, to be sold to members. I find that it would be almost next to impossible to give accurately the actual cost per bullock or sheep from the time of purchasing to slaughtering, but the total expenses of the butchering department works out at about 2s. 1d. in the £ on the entire sales, and this includes many other things besides sales of beef and mutton.

"With regard to offal, such as liver, skirt, tail, kidneys, etc., these are disposed of in our own retail branches, and the fat we make up into lard and dripping. The hides and skins are disposed of at weekly auction sales."

The Manager of the Bolton Co-operative Society writes:—

"Our butchering manager attends the Manchester and Preston markets and purchases cattle and sheep at the best market prices. The cost from market to slaughter house is about 1s. 6d. per head for cattle purchased. The whole of the cattle is slaughtered by our

own butchers, who, in addition to being branch managers, call at certain periods of the week and slaughter all the cattle we require. Although it is difficult to give you an idea of the cost of such work, we might say, roughly, that for slaughtering purposes and preparing meat for sale, the amount would be on an average 2s. per bullock and 4d. per sheep. To this, of course, must be added the various items involved in distribution. All offal is prepared and sold in our own branches."

Further to my visit, the Manager of the Middlesbrough Co-operative Society writes as follows:—

"Our Managing Buyer, Mr. Hobson, attends the Newcastle market every Tuesday, and makes purchases thereat; in addition, he has a good local connection with the farmers of the District. With respect to his buying at the market, *he buys everything off-hand or by bulk*, the success of each deal altogether depending upon *his judgment* and business bartering.

"With regard to cost after purchase, the first item is carriage from the place of purchase, which, in the case of Newcastle, where we get the greater part of our stock from, amounts to 2s. per head and 6d. per head, of cattle and sheep respectively. The charge for individual slaughter men is 2s. per head and 6d. per head for cattle and sheep respectively, but when the slaughtering is done at an abattoir like ours, where a number of men are engaged at this work, the cost comes out at much less than the above. To this must be added the cost of cartage from the abattoir to the shop, which will vary according to the distance.

"Disposal of Offal.—This consists of the liver, skirt and kidney, heart, head, tail, and tripe—these are all retailed to the customers in the same manner in which the meat is disposed of.

"The tallow is converted into dripping, and sold to fish fryers; the greaves are sold for poultry food. The intestines are all cleaned, and up to the present have been consigned to Germany.

"Bones.—These are all put through a digester, all fat and gelatine extracted; they are then dried and put through a disintegrator, and converted into bone-meal, and sold for agricultural purposes, this finding a ready market. The fat extracted from the bones is also sold to the fish-fryers. The gelatine is used in making potted meat, etc. The hides and skins are sold, part to the C.W.S. and part to the local hide and skin company, the latter being a great convenience to us. I may say that our butchering department is a very successful one, the gross profits of last quarter amounting to over 25 per cent. on sales, whilst our prices compare very favourably with local private firms.

"No other Society's balance sheet that I have seen has shown anything like so gratifying results."

The following I have received from Messrs. Wm. Douglas and Sons, Putney:—

"I find on referring to the books that the total cost of the various appliances at Stockton, inclusive of the overhead track bars, refrigerating plant and fittings for the steam room and sausage room, came to £1,500. The actual cost, without the machinery for the sausage room and the steam room, which, of course, would not be required in an ordinary public abattoir, would be about £200 less, viz., £1,300.

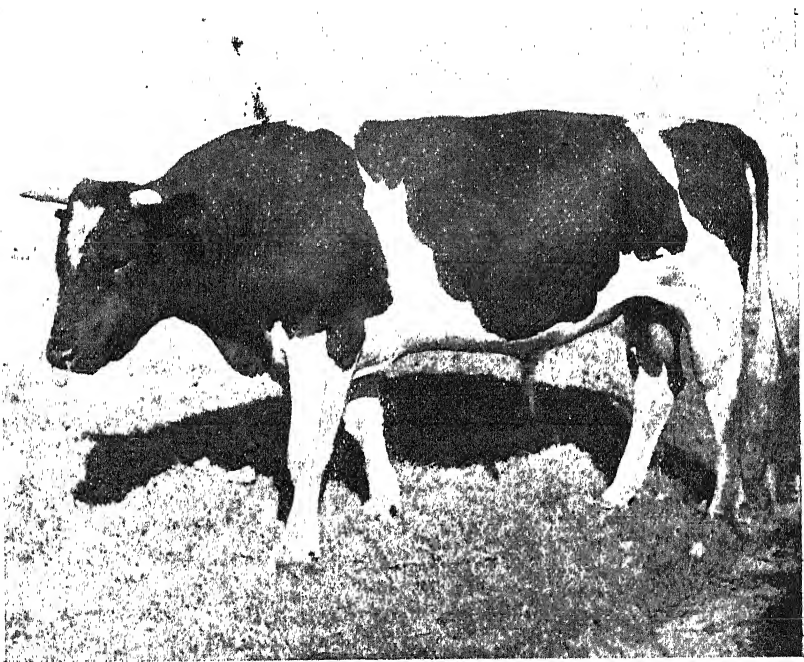
"The lairage fittings would cost about £100 extra, but have not a note of this, so that the original figure of about £1,500 may be taken as the actual cost.

"In shipping goods to South Africa we require to provide special packing cases, and these cost an average of 3 per cent. on the estimates. This sum we always charge.

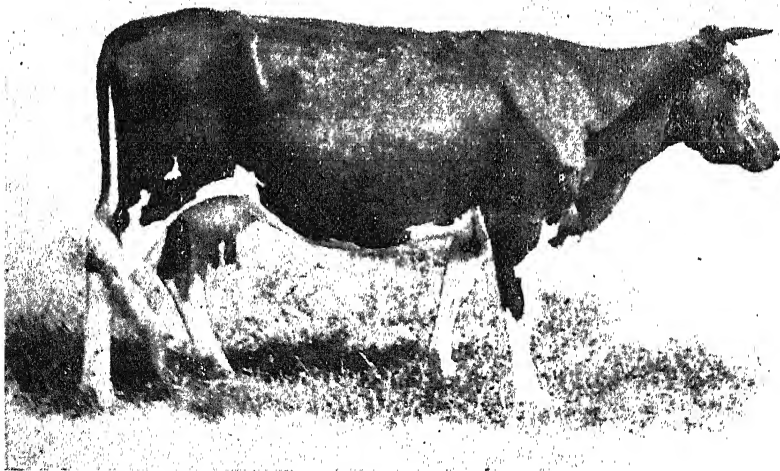
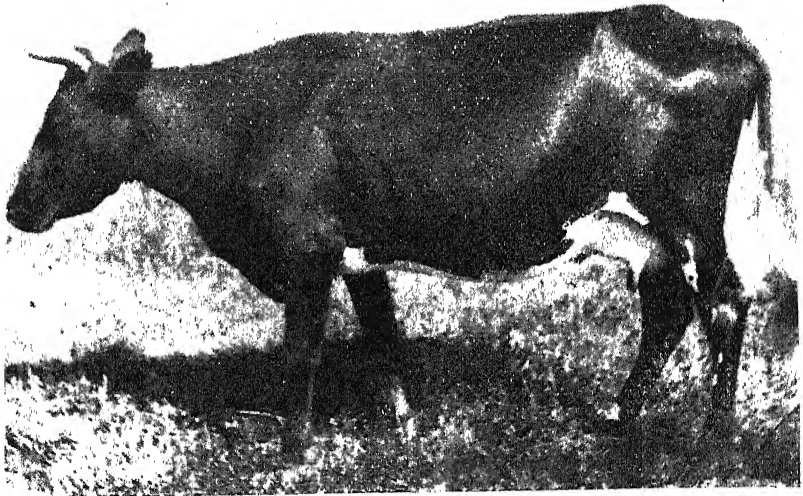
"With regard to the cost of the buildings, you will recollect that they stated it would cost when finished about £2,000. Of course, much lighter buildings—at least, in the abattoir part of the structure—would answer your purpose in South Africa. Taking into account the increased price of material and the cost of skilled labour in South Africa, I should say that you might reckon the cost of the buildings at about £1,500."

COLONIAL-BRED FRIESLAND CATTLE AT WORCESTER.

Mr. F. Conradie of Worcester has kindly forwarded photographs of some local Friesland cattle which have made their mark in the district. They are Colonial-bred and belong to Mr. P. K. du Toit, of Over Hex River. The bull was awarded first prize in the Colonial Class at the Worcester Show of 1905. The photographs are reproduced herewith for the benefit of those of our readers who take an interest in that breed.



Colonial bred Friesland bull the property of Mr. P. K. du Toit, of Over Hex River.



Colonial bred Friesland ccws, the property of Mr. P. K. du Toit, of Over Hex River.

MR. BURBANK'S PLAN OF GROWING ENGLISH WALNUTS.

MR. LUTHER BURBANK, at the Fruit-Growers' Convention at
Santa Rosa, California.

When nut culture is mentioned in California, it is well to be specific, for nearly every nut which grows in any temperate or semi-tropic climate finds here a most congenial home, and most of them thrive even better than in their native country. Nowhere else are there so many kinds grown successfully, and our dry, sunny autumn days insure a most uniformly well-cured product, while in most climates it is, even when ready to harvest, a very difficult matter to secure the crop in prime condition.

THE ROYAL NUT.—Although all nuts can be well grown here, yet the Royal walnut (*Juglans regia*) will without doubt in some of its improved varieties always be the leader. The Royal, long known in commerce under various names, such as Persian, English, French, Welch, Italian, European, Madeira, Chili, and later as the California walnut, has been cultivated for more than 2,000 years. It is a native of the Caucasus, Persia and the northern mountains of India, and probably also of western China; the Royal walnut, the peach and the apricot were all derived originally from the same region, where they may all still be found growing wild. The nuts from the wild native varieties have rather thick shells, are much smaller, not of as good quality, and not as freely produced as with our greatly improved cultivated ones. The name walnut came by an English corruption of the word Gaul—Gaulnut (France)—from which England even to-day draws her principal supply.

IN EUROPE.—Royal walnut trees have been common throughout central and southern Europe from the sixteenth century down to the present time; but for 2,000 years the crop has been mostly raised from seedling trees. If a knowledge of the possibilities for improvement by selection and grafting had been generally applied during this long time, these nuts would have been a universal food throughout the whole earth, and productive trees of superior varieties would have been common everywhere, though cold winters have occasionally greatly injured and sometimes destroyed many of the trees even as far south as France and Germany, where the timber is much used for furniture and other purposes, and has been so highly prized that bearing trees have been sometimes sacrificed

for lumber, and for almost 200 years France has maintained an Act to prevent the exportation of walnut lumber.

IN THE UNITED STATES.—In America the Royal walnut grows as far north as New York and New England. The trees were quite common on Manhattan Island 150 years ago, but later the march of improvement necessitated the removal of most of them; the crop of nuts was, however, always very uncertain and not encouraging from a business point of view.

In California the trees have been growing in widely separate regions from the earliest times, but, unfortunately, mostly from nuts whose heredity harked back to forms better adapted to the production of wood than nuts, and before the improved ones had been produced or introduced, the trees were in productiveness mostly shining symbols of perverse uncertainty.

Our southern neighbours were the first to obtain some of the improved varieties, and have been well repaid for their enterprise and foresight, for nothing which grows on trees has generally paid better than walnuts; but much had to be learned about soils, locations, varieties, stocks, distance for planting, modes of harvesting, curing, marketing, etc.

NEW DISTRICTS.—Central and northern California are just waking up to the fact that no better walnuts have ever been produced than those grown right here, and from the one large orchard of the Franquette, and the numerous ones of the Santa Rosa, now in full bearing, the nuts have so far brought in all cases 18 to 20c. per pound, or even more, by the ton, when walnuts from anywhere else were selling at from 9 to 14c. per pound.

TWO IMPORTED VARIETIES.—Judge Lieb, of San Jose, who has made a special study of the walnut in every condition for several years, has obtained samples and definite particulars from many American and foreign growers, and with a careful personal inspection of the best orchards of this State, has, after the most severe tests, concluded that for growing in northern and central California, but two varieties need be considered—the Franquette and the Santa Rosa.

Taken point by point, in comparison with all others now known, they appear to stand at the head for general culture here. The Franquette is an old, well-known French walnut, grown only by grafting. The Santa Rosa, so far, has been grown mostly as seedlings, and, even grown in this way, has proved to be all that could be desired in early ripening, early bearing, productiveness and quality; but among these seedlings are found some trees which are most remarkably early and constantly productive of astounding crops of nuts of most perfect form, colour and quality. Some of the best of these will, in my opinion, supplant the Franquette, for though the Franquette blooms later than the Santa Rosa, and produces a fair crop each season almost without fail, but rarely a full one, yet in a series of years the Santa Rosa generally will out-

yield it two to one, besides being harvested with much less care and expense, ripening, as they do, two to four weeks earlier when the air is clear and the ground dry. The greatest fault of the Santa Rosa is their tendency to start early in the spring. The greatest fault with the Franquettes for growing in this part of the State is their late ripening, causing much care and expense in harvesting and curing. The size, appearance and quality of the nuts of either are all that can be desired, though the Santa Rosas generally have a whiter shell, and the husk does not require removal by hand, as is the case with a large part of the crop of Franquettes. To those who have had experience in this kind of work on a rainy day, nothing more need be said. The Franquette seems well adapted to some of the larger interior valleys.

GRAFTING ON NATIVE STOCK.—In all cases the best results will be obtained by grafting on our native California black walnut or some of its hybrids. No one in central and northern California who grows Royal walnuts on their own roots need expect to be able to compete with those who grow them on the native black walnut roots. For when grown on these roots the trees will uniformly be larger and longer-lived, and will hardly be affected by blight and other diseases, and do and will bear from two to four times as many nuts which will be of larger size and of much better quality. These are facts, not theories, and walnut growers should take heed.

HOW TO START AN ORCHARD.—Although not popular among nurserymen, yet the best way to produce a paying orchard is to plant the nuts from some vigorous black walnut tree, three or four in each place where the tree is to stand. At the end of the first summer remove all, but the strongest grower; cultivate the ground well; any hoed crop may be grown among them. Let the trees grow as they will for from three to six years, until they have formed their own natural, vigorous system of roots, then graft to the best variety extant which thrives in your locality, and, if on deep, well-drained land, you will at once have a grove of walnuts which will pay at present, or even very much lower, prices a most princely interest on your investments.

By grafting in the nursery, or before the native tree has had time to produce its own system of roots by its own rapid-growing, leafy top, you have gained little or nothing over planting trees on their own roots, for the foliage of any tree governs the size, extent and form of the root system. Take heed, as these are facts, not fancies, and are not to be neglected if you would have a walnut grove on a safe foundation.

A GREAT WALNUT RECORD.—I hold in my hand a record and also a photograph of one of the Santa Rosa walnut trees, grafted, as I recommended, on the black walnut, in 1891; this was handed to me by the owner, George C. Payne of San Jose. The record may be of interest to you: Dimensions (1905)—Spread of top, 66

ft.; circumference 1 ft. above ground, 8 ft. 9inch. No record of nuts was kept until 1897, which amounted to 250 pounds.

				Pounds.
1898	...	...	...	302
1899	...	...	...	229
1900	...	...	...	600
1901	...	...	...	237
1902	...	...	...	478
1903	...	...	...	380
1904	...	...	...	481
1905	...	...	...	269

The walnut has generally been considered a very difficult tree to graft successfully. Mr. Payne, mentioned above, has perfected a mode of grafting the walnut, which in his hands is without doubt the most successful known; by it he is uniformly successful, often making 100 per cent of the grafts to grow. Who can do better by any method?

There are thousands of native black walnut trees in northern and central California, in fields, pastures and roadsides, which, if grafted to the same or some of the still further improved Santa Rosa walnuts, would yield even larger crops and better nuts than this tree is yielding.

PLANT THE WALNUT.—When you plant another tree, why not plant a walnut? Then, besides sentiment, shade and leaves, you may have a perennial supply of nuts, the improved kinds of which furnish the most delicious, nutritious and healthful food which has ever been known. The old-fashioned hit-or-miss nuts, which we used to purchase at the grocery store, were generally of a rich, irregular mixture in form, size and colour, with meats of varying degrees of unsoundness, bitter, musty, rancid, but, better yet, with no meat at all; from these early memories, and the usual accompanying after-effects, nuts have not been a very popular food for regular use until lately, when good ones at a moderate price can generally, but not always, be purchased at all-first class stores.

The consumption of nuts is probably increasing among all civilized nations to-day faster than that of any other food, and California should keep up with this increasing demand and make the increase still more rapid by producing nuts of uniform good quality, which can here be done without extra effort, and with an increase in the health and a rapid and permanent increase in the wealth of ourselves and neighbours.

I have not mentioned other nuts, as your time and mine allow of but a glance at this one nut. The almond and pecan come next in importance, followed by a score of others which will be extensively grown, as their culture is better understood.

GRAND FUTURE POSSIBILITIES.—California has made wonderful strides in the production of fruits and nuts, and of almost every-

thing else, but its newer horticultural possibilities are even more grand, mostly unknown and undeveloped. Who could have imagined 25 years ago the important places which the fig, the orange, the vine and other fruits and nuts, as well as alfalfa, winter vegetables, stock and poultry raising now hold? And who can prophesy the future place of California as the source of the choicest food products of the world?

This paper was prepared at the fervid and persistent request of the secretary of the State Horticultural Commission solely for the benefit of prospective planters. Do not address me on walnut culture. I have no trees or nuts for sale, and have no time to reply to letters on the subject.—*Pacific Rural Press*.

THE CASTRATION OF OSTRICHES.

The following paper by Government Veterinary Surgeon Elley, was read at a meeting of the Oudtshoorn Farmers' and Fruit-Growers' Association held on Saturday, July 21st, as reproduced by the *Oudtshoorn Courant*. Mr. Elley said:—Mr. Chairman and gentlemen,—I must first thank you for the honour you have done me in requesting me to read this paper before, I may safely say, the leading ostrich farmers in the world. I agreed to do so, not so much with the idea of telling you how I perform the operation of castration upon ostriches, but with the hope that in the discussion which will follow I shall learn your opinions on the subject; whether or not you consider it will be advantageous. It is about two years since the idea of castrating birds first occurred to me. I was then travelling through the Swellendam district, and it struck me that an excess of male birds, under certain conditions, must be a decided drawback. However, at that time my permanent head-quarters were in Cape Town and I had no opportunity of putting my ideas to the test, but after being moved to Beaufort West and again coming into contact with birds, I discussed the subject with the leading farmers of that district and found they were of the same opinion, and the Hon. P. D. de Villiers, M.L.C., and Mr. J. P. de Villiers, to whom my best thanks are due, willingly consented to place some birds at my disposal, if I would attempt the operation. I then endeavoured to ascertain if it had ever been attempted previously, in order that I might have some data to go upon, but I could hear of nothing definite; if it had been attempted, certainly nothing had been recorded, so that I had several things to consider, viz., (1) the site of the operation, (2) the best age at which to operate, and (3) the manner of controlling

the bird, etc. Naturally, I first turned to the method I employ in the caponizing or castration of the ordinary farm-yard cockerel; but after closely examining a bird and making a *post-mortem* examination, I came to the conclusion that it would be impracticable to operate by that method, the position of the upper leg and the large powerful muscles attached to it, rendering it almost impossible to make the incision *in front of the leg*, as recommended for cockerels, without injuring the lungs. Regarding age, within certain limits, the younger the birds the better the results would probably be. After numerous *post-mortem* examinations I came to the conclusion that from eighteen months to two years old was the best age, the testes are then beginning to develop, are easily located, but are not yet so vascular as to occasion any probable risk of hemorrhage. Moreover at this age you would know from the feathers if the bird is going to be worth keeping for a breeding bird. After trying various methods of controlling birds, I came to the conclusion that it was safest and simplest to administer chloroform. My method of operating is as follows:—

Have the birds brought into the kraal on the afternoon of the day before it is intended to operate, so that they may have no food whatever for say twenty hours before the operation, as the less ingesta in the stomach and bowels, the better and easier it will be. If possible there should be three adjoining kraals; the first in which to catch the birds, the second or middle for operating in, and the third in which to place the birds after the operation. The operating kraal should be well sprayed with a weak solution of Jeyes' Fluid or Little's Dip before commencing. The first bird is caught and brought to the operating kraal and the chloroform bag placed on his head with rather less than half an ounce of chloroform (2—3 teaspoonfuls) on the cotton wool. One good boy can then hold him until he is properly under the influence of the anæsthetic. A little more chloroform can be added after he is down, and if necessary once or twice during the operation. One ounce, or at the most one-and-a-half ounces, should be sufficient for the whole operation. Ascertain by moving the wings or striking him, if he is properly under, then place him on his left side. A boy now grasps the right leg and brings it slightly further forward than at right angles to the body. The seat of the operation is now exposed. It lies in the angle formed by the leg and the lower edge of the innominate bone, about three inches behind the former and one-and-a-half inches below the latter. The innominate bone can be felt as a distinct ridge running backwards and slightly downwards, about the middle of the body immediately behind the leg; it corresponds to the lowest part of the body on which any feathers are found. It is immediately below this ridge that the incision is made. The operator should now wash his hands and the seat of the operation with a solution of Jeyes' Fluid or other disinfectant.



THE CASTRATION OF OSTRICHES.

1. Bird going under chloroform; 2. Bird under and ready for the operation, Mr. De Villiers is pointing to the site of incision; 3. Bird sleeping after operation, the sutured external wound can be well seen; 4. Bird waking up from chloroform.

THE OPERATION.

Make an incision about four inches long, cutting from before backwards, in a line parallel with the ridge mentioned above. Cut down until the peritoneum or thin membrane covering the bowels is reached. Care is required at this point. Having reached the peritoneum grasp it with the forceps, taking care not to include any of the gut, and draw it slightly towards the external wound, then make an opening through it just large enough to admit the hand. Pour a little carbolic oil over the right hand and force it gently through the opening into the abdominal cavity. The testes are easily located about three to four inches further forward than the incision, almost exactly between the upper extremities of the two legs, situated on and closely attached to the middle of the roof of the abdominal cavity, immediately below the kidneys. In birds of an age which I have recommended for the operation they are felt as two elongated firm structures, about one-and-a-half inches long by a quarter of an inch broad, somewhat the shape of a .303 bullet. They lie about two inches apart, the left usually slightly more forward than the right. Having located them, the tissue round about them is easily broken down by the fingers, and a few twists liberate them and they fall into the palm of the hand. Both testes should be located before either is removed. With care the one can be liberated and held in the palm of the hand whilst the fingers free the other one. It is then only necessary for the hand to enter the abdominal cavity once and be once withdrawn, containing both testes. If the birds are in very good condition there will be a certain amount of fatty tissue round the testes which may give a little more trouble in removing them. Having withdrawn them it only remains to suture the wound. Thread a needle with fine cat-gut and put two or three stitches through the peritoneum or membrane taking care not to prick the gut in doing so. Then stitch the external wound with three or four stitches including the skin and muscle. Dress the external wound with a little iodoform and the operation is complete. Whilst the last stitches are being put in, the chloroform bag should have been removed. Allow the bird to lie quietly until he wakes up and let him take his own time about rising, on no account frighten him up or he will invariably attempt to rise before the effects of the chloroform have quite passed off and in falling or struggling the stitches may be broken. Watch the breathing throughout the operation, it should be steady and regular. Should it become jerky or irregular, at once open the end of the chloroform bag and admit more air.

AFTER TREATMENT.

For the first twenty-four hours after the operation the birds should be placed in as quiet a camp as possible, where they are not

likely to be frightened or made to run. Green lucerne is the best food both before and after the operation.

INSTRUMENTS.

All the instruments required by anyone operating by this method are: (a) chloroform bag, such as the one I have had made, (b) sharp knives, (c) needles and cat-gut, (d) needle-holder. This latter will be found useful for the deep stitches in the peritoneum.

ADVANTAGES RESULTING FROM THE OPERATION.

Having described the operation I will briefly enumerate the advantages which it is claimed will result from it.

1. It is claimed that with the increased condition of the bird which is sure to follow the operation, there will be increased weight of feathers.

2. That owing to the quieter life of the bird the feathers will be less damaged by fighting or scraping on the ground than in the entire bird.

3. In droughts or when food is scarce, castrated birds will keep in fair condition where entire birds would starve.

4. I believe the flesh of a capon will prove an acceptable article of human food. I am quite prepared for this idea to be ridiculed to-day, but in time to come it may be considered.

This then I think brings the paper to a close. I purposely left the benefits which it is claimed will result from the operation, until the end, so that they might be fresh on your memories when the discussion opens, as it is on this point particularly that I wish to hear the opinions of you all. I am aware that the method of the operation itself may be improved upon, but you may safely leave that to the veterinary staff, once we are convinced of the advantages which will arise from it.

Gentlemen, I thank you for your kind attention.

At the conclusion of the paper, which was received with applause, Mr. Elley's "instruments," and a series of photographs clearly shewing the manner of the operation, were exhibited.

Mr. J. M. Raubenheimer said they were all greatly beholden to Mr. Elley for his excellent paper, and it was clear that the very best of their ostrich farmers had much to learn from their Veterinary Surgeon. He had much pleasure in proposing a very hearty vote of thanks to Mr. Elley for his admirable lecture. This was seconded by Mr. Maurice Meiring and carried by acclamation.

Mr. Meiring said that he was convinced that the caponizing of male ostriches would result in a heavier crop of feathers, and he trusted that all of them who were ostrich farmers would give Mr. Elley every assistance and encouragement in his experiments and investigations.

Mr. J. H. J. le Roux said he had been deeply interested in the

paper. He would ask Mr. Elley to give them some information as to the cost of the operation.

Mr. Elley said the Government Veterinary Surgeon's services were free. The farmers could give the necessary assistance themselves, and about 3s. worth of chloroform would be sufficient for more than a dozen birds.

Mr. Rex asked whether there was any danger in the operation, and whether it was of so simple a nature that it might easily be learnt by intelligent young farmers who had a bent that way?

Mr. Elley said he had never once failed in his operation and the manner of it was certainly simple enough for any intelligent young man to learn easily.

Mr. Ernest Edmeades said that he had seen Mr. Elley perform an operation and it was simplicity itself.

Mr. A. M. Martin said that he, too, was of opinion that the operation would result in a heavier crop of feathers and perhaps also they would have longer feathers, but the one point upon which he was not satisfied was that the feathers might lose their natural gloss, which was an important consideration with buyers. He would suggest that experiments should be made by comparing the feathers of birds before and after the operation, and also the feathers of birds that had been castrated with those of the same broods that had been left entire.

Several other members expressed the same views.

Mr. Allan said that the Committee would arrange for demonstrations on certain farms and that notice would be given to those neighbours who were interested so that they might come and see the operations performed.

On the motion of Mr. Rex it was resolved that the Secretary have 500 copies of Mr. Elley's paper printed in English and Dutch for distribution amongst ostrich farmers.

THE PREPARATION OF WOOL FOR MARKET.

A Few Practical Points for Sheep-breeders.

(By S. B. HOLLINGS)

The seventh International Conference of Sheep-breeders, convened by the National Sheep-breeders' Association, London, took place in the Guildhall, Derby, on June 26th, the meeting being held on the eve of the opening of the Royal Agricultural Society's Show. The town being full of farmers, it was not surprising that there was a large attendance. In addition to all the leading English sheep-breeders, there were also present leading sheep men from Australia, New Zealand, South Africa, the Argentine, and the United States. In the absence of the president, Mr. J. Flower, Chilmark, Salisbury, presided. Applications for affiliation were received from two Colonial societies, which were agreed to. The chief event of the Conference was the reading of a paper by Mr. S. B. Hollings, his subject being, "The Preparation of Wool for Market." He said:

CHANGED CONDITIONS.

It is impossible on an occasion like this to overlook the fact that this Conference meets under considerably changed conditions to what obtained in the wool world some four or five years ago. Every meeting of sheep-breeders in every part of the world was then bemoaning the fact that wool values were low in the extreme, and a pessimistic note was uppermost at all Conferences where the wool question was discussed. The opinion was generally expressed here in England that wool was but a "by-product" of the farm, and all the exhortations of users to prepare wool for market in a better way seemed as but a voice speaking out of a wilderness. To-day the language of sheep-breeders has changed, feelings of satisfaction are everywhere expressed, due to the great transformation which has come over the wool markets. On every hand there is an incentive for all sheep-breeders to look at their growing fleeces with feelings of pride, and to-day, manufacturers can urge, with some degree of reason, the necessity of preparing wool for market in a real, practical, and "up-to-date" manner. I have thought it advisable, while speaking of the changed conditions under which we meet, to briefly set forth the marvellous transforma-

tion in price which has taken place and below I set forth a few leading descriptions of wool, comparing to-day's values with what the same descriptions were selling at a few years ago. The lowest point touched was at the end of 1901, to-day's values for cross-breeds, which mostly interest this Conference, being higher than for over thirty years. The following table is well worth considering by every sheep-breeder throughout the world :—

Comparison of Values of Washed Wools.

		Nov.-Dec., 1901		May, 1906.	
		Lowest.		To-day.	
		d.		d.	
Lincoln hogs	7 $\frac{3}{4}$	...	15
„ wethers	4 $\frac{3}{4}$	...	13 $\frac{1}{2}$
Deep hogs (Midland Counties)	5 $\frac{1}{4}$	...	14
„ wethers	4 $\frac{3}{4}$	...	13 $\frac{1}{2}$
Shropshire hogs	7 $\frac{1}{2}$	...	15 $\frac{1}{4}$
„ wethers	7 $\frac{1}{4}$	...	14 $\frac{3}{4}$
Half-bred hogs	7 $\frac{3}{4}$	...	14
„ wethers	6	...	13 $\frac{1}{2}$
Kent wethers	5 $\frac{1}{2}$	...	14
Irish hogs	6 $\frac{1}{4}$	...	15
„ wethers	5 $\frac{1}{2}$	...	14
Wiltshire Down tegs	9 $\frac{1}{2}$	...	15 $\frac{1}{2}$
Scotch blackface	4	...	8 $\frac{3}{4}$
New Zealand medium crossbred...	4 $\frac{3}{4}$	...	15
„ coarse	„	...	4	...	13
Crossbred tops, 40's	7	...	18 $\frac{1}{2}$

I do not think that any other known period in the history of the world has shewn such a radical change in wool values in so short a space of time, and it is to be sincerely hoped that good paying prices for wool growers will obtain for years to come. Such a satisfactory condition of affairs naturally puts every sheep-breeder in every country of the world in a good temper, and now that prices are on a good paying basis it is to be hoped that the claims of the buyer in regard to preparing wools for market in a better and more business-like way will be more universally regarded.

A SUBJECT THAT TOUCHES EVERYONE.

The question at issue is one that affects all parties, and appeals directly to the wool grower equally as much as it does to the wool buyer. I have always maintained that the interests of sheep-breeders everywhere are identical with those who have their fleeces to buy and consume, and when one section suffers, it affects “for better or for worse” both sides of the trade. It is impossible for any sheep farmer to grow a badly-nourished clip of wool without the manufacturer feeling the ill effects of that clip, while on the

other hand fleeces which are sound, shafty, of good length and nice quality, and prepared for market in a business-like way, cannot be offered without the manufacturer being satisfied with the excellent manufacturing properties of the wool in question. The great woollen and worsted industries cannot continue without users being supplied with good, usable wool, hence sheep-breeders everywhere will recognise that they have many interests in common, this question of first-class wool production affecting the grower and the user alike. The ideal of the sheep farmer may be briefly summed up in the words—good wool and correspondingly good prices—and to obtain the latter it should always be borne in mind that buyers look out for the cleanest and the best. Preparing wool for market as our grandfathers did will not do in these days, hence the need there is to look at this question in a plain, practical, and common-sense way.

ENGLISH SHEEP FARMERS LACK ENTHUSIASM.

No one at all conversant with, say, English and Colonial methods of wool preparation for market can deny the fact that our Colonies set their English brethren a good example of how to do it. The average Australian and New Zealand pastoralist is far more enthusiastic over his shorn fleeces than the average British sheep farmer, and for many reasons this is to be regretted. I durst hazard the opinion that if the clip, say, 250 fleeces of an average English sheep farmer were taken, that more objectionable and foreign matter would be taken out of those fleeces than could be found in 1,000 to 2,000 fleeces of Australian or New Zealand origin. A word of praise is due to Colonial sheep men for the splendid way in which they prepare their clips for market, and "false packing" is practically an unknown quantity in Australasia. This I do not think can be put down to any lack of knowledge on the part of the average English sheep farmer, but a lack of enthusiasm, coupled with a false impression which the majority have in respect to rolling in all the foreign matter adhering to the shorn fleece. Without any hesitation I say that Australasian sheepmen set a noble example in wool preparation for market to their competitors in every part of the world where sheep are kept, and one good reason why Australian merinos and New Zealand crossbreds have got the name they have is because of the up-to-date and satisfactory way in which the fleeces have come to market, English sheep farmers especially lack enthusiasm, an air of indifference being manifest on this important and "live" subject.

CAN ENGLISH FLEECES BE DEALT WITH LIKE COLONIAL?

The question naturally arises: Should English fleeces be dealt with like colonial, seeing the latter come to market so well got up, and fulfilling all the requirements of the trade? I don't think buyers ask for any such thing, seeing that the average colonial clip

is a good deal larger than the average clip of the sheep farmer at home. It would never pay British wool growers to make the classes that their Australian cousins do, and no man wants to see combing, clothing, pieces, broken, bellies, and locks, which usually constitute an Australian clip of wool. But buyers do want a better system than is at present in vogue, whereby English sheep farmers as a rule roll into the fleece all the bellies, britch, and shearlings which adhere to the fleece. This cannot be called wool, it simply being so much foreign matter which the sheep has picked up during its existence. All this has to be removed some way or another, either by the sheep farmer himself or the buyer; for earth, dung, straw, and vegetable matter never made tops, yarns, or pieces, and never will. If an English sheep farmer was shearing, say, 500 sheep, there would be a need for him to treat his fleeces in something like Australasian fashion; but when 50 to 250 fleeces only have to be dealt with, the regulations observed by New Zealand pastoralists can to some extent be modified. This brings up the question of how colonial sheepmen prepare their fleeces for market.

COLONIAL METHODS OF PREPARATION.

Briefly put, every colonial station of even average dimensions places at the head of the clip a competent classer, whose business it is to see that every fleece is properly classed as to quality, then skirted and locked before being put into the bale to be packed for market. Every shorn fleece is handled with intelligence, careful attention being paid to those points which a grower knows will tell in favour when the wool is offered for sale. A good attempt is usually made to keep all the qualities separate, "mixed" parcels only being taken by those who like to buy such a clip of wool at more or less a speculative price. *Uniformity of quality* is a very valuable feature in any parcel of wool, and buyers know how to appreciate this when they see a clip straight and uniform in regard to quality and breed of wool. It is a great mistake to bale together fine and coarse fleeces, and even when handling fleeces of the mutton breed it pays to bale separately the fine, medium, and coarse fleeces.

It must be remembered that before these leave the sorting table, every fleece, without exception, is taken and skirted—that is, the heavy bellies and britch are removed, the remaining fleece then being taken and rolled up separately. I have not time here to go into every detail of the operation, everyone present knowing exactly how the work is done. The great thing to remember is that seldom anything of an objectionable nature is rolled into the fleece, the bellies, stained pieces or britch, and the locks being baled separately, and then each lot being sold on its merits. By this method of marketing wool, buyers approach with confidence Colonial clips,

men being satisfied that the middle of the bale will be as free of foreign matter as are the fleeces on the outside edge. A vast improvement has of late years been noted in connection with the wools from the River Plate, though even here there is hardly that uniformity in classing and preparation for market which one observes say, in New Zealand fleeces of a corresponding quality. I now leave out Australian wools, because the great bulk is merino; English, New Zealand, and River Plate wools all coming under the category of crossbreds. During the past ten years—thanks to the introduction of the best English blood, and the adoption more or less of Colonial methods—River Plate wools have vastly improved, both in quality, character, and general get up. Still, there is room for improvement, and particularly the system of selling all the qualities together, which so frequently is the case. When fine and coarse qualities of crossbreds are sold together, the buyer, as a rule, tries to secure the parcel at the value of the coarser quality, consequently the grower makes a sacrifice which he need not do if he will, before baling, separate the fleeces into their respective qualities, say fine, medium, and coarse. A New Zealand clip, as a rule, is done in this fashion, hence we see the big prices being paid to-day for New Zealand grown wools. It does indeed shew to what perfection crossbred wools are being grown in New Zealand, when greasy half-bred is selling from 15d. to 17d. per lb., this being the reward for general excellence on the lines I have just named. It is hardly to be expected that English sheep farmers will go to the trouble of classing like we see in New Zealand, but as regards keeping out extraneous matter, it must be done, otherwise that clip will inevitably suffer in regard to price per lb. No buyer to-day wants “muck” or dirt at the price of wool, hence the question of false packing must be considered.

EVILS OF FALSE PACKING.

The evils of false packing cannot be over-estimated, and wherever practised it is bound to reflect discredit on the woolgrower who does it. All honour to Australasian pastoralists for setting their minds against such a system, and it would be a good thing if the same could be said for British and South African sheep farmers. I venture to say that the worst element in connection with our home-grown fleeces is the bad way they are prepared for market, while Cape wools are notorious for the excessive wastiness and falseness in which they are sent to market. The system of selling wool in Cape Colony can be vastly improved where the up-country store-keeper pays the same price for the badly got up wool as he does for the clip that has been well locked and skirted, but here in England there cannot be any possible excuse for any sheep farmer to roll into his fleeces heavy bellies and britch without the draggings or “muck lumps” being removed. I am certain that the farmer who

will persist in adopting this evil practice is doing so to his own financial injury, it being a mistaken policy for any man to think he is gaining anything by doing it. Some will even put into the middle of a fleece washed locks, and then see that such fleeces are put into the middle of a bale. Others never think of removing the heavy lumps of dirt that are adhering to the bellies and the britch, rolling in the entire lot. This will never make up into cloth, but will have to be clipped off; while even if the wool comes to be scoured, all this extraneous matter will go down the drain. It must ever be borne in mind that every wool buyer acts upon the adage "once bitten, twice shy." If a buyer purchases a clip of wool and the same turns out to have been badly handled, that farmer's next clip will be ear-marked, and that buyer will make a serious attempt to get back out of the farmer the loss he encountered the year previous. Nothing shakes a buyer's confidence so much in any clip as to be deceived in the "clean yield" which he estimates the wool will give, and "lost confidence" is a serious matter for any clip of wool no matter where grown. Let the shearing be done on a clean swept floor, and by no means let the operation be conducted on a bed of straw. The floor swept clean will prevent vegetable matter from becoming entangled with the wool, and see that everything is clean and the whole fleece carefully gathered up before the shearer commences to shear the next sheep. False packing cannot be justified at all, but is decidedly injurious to the sheep farmer who practises the habit. Remember here that honesty is the best policy.

BENEFITS OF A GOOD NAME FOR A CLIP.

No better asset can a wool grower have for his clip than a good name, and this can, perhaps, best be appreciated by Colonial squatters. Wool buyers in this country know that certain clips have won for themselves a name which is synonymous with integrity and honesty, and when offered in London or Australian markets they command the unreserved attention of every member of the trade. This is due entirely to the wool possessing excellent manufacturing characteristics, and also to the upright and straightforward way in which the clip is prepared for market. "Faking" is an unknown quantity, and in this respect our home wool growers can with advantage copy the example. A good name for a clip of wool benefits the owner just the same way as a bad name injures the producer, and when a clip becomes known to yield well, and there has been no attempt at faking, that clip always receives the full advantage of competition, and the best price possible that is ruling. South African wools have lost prestige on the markets of Europe because they have done so badly for buyers, the preparation for market being so badly performed. When growers will persist in rolling into their fleeces everything that has been picked up

while the wool was growing, no surprise need be felt at the "gingerly" way in which such wools sell. In a quiet time, and when prices are low, a buyer favours the most that man's wool which he knows in the past has been properly skirted and locked, while, if he handles a doubtful clip, he allows sufficient margin to compensate him for any unexpected eventualities. The reason why all objectionable matter should be removed is because, first, it is a dishonest practice to bale it with the straight, full grown fleece; second because it encourages suspicion; and thirdly, because vegetable matter is not wool.

VEGETABLE MATTER.

Vegetable matter in wool has this last eighteen months occupied a very prominent position in the wool world, due to a large extent to its being on the increase. Growers really cannot fully estimate how injurious this is, manufacturers alone being able to estimate the importance of keeping fleeces free from everything vegetable in character. Put it down as a well-defined principle that more vegetable matter there is in shorn fleeces, and the more will buyers fight shy of it in the future, besides paying less for it. Wool containing loose hemp, string, straw, short fluffy bits from the inside of tares, means much extra cost in manipulation, while, owing to vegetable matter not taking the dye like wool, it has been the direct cause of serious loss arising through spoiled pieces. There are several forms of vegetable matter which wool growers need to watch with the strictest vigilance. While the fleece is growing, there is the vegetable matter which is picked up. In colonial fleeces this is represented by burrs, seeds, and shivs, while in English wools the worst feature to contend with is straw. After washing, sheep should never be turned into straw before shearing, while, even in the turnip field, straw should not be spread unless the land is very heavy and wet. Then there is vegetable matter getting into the fleece while shearing is being conducted, and this should be avoided by the shearing floor being kept entirely free from all extraneous matter. Of course this can be picked out at the sorting table, but it means increased cost, and this the sheep farmer has to pay by receiving less for his clip. Then there is the worst feature of all, namely, the tying up of fleeces with loose, fluffy, jute twine. This practice has nearly disappeared, and the sooner it is a relic of the past the better. It is mostly practised in the South of England, and principally in the counties of Somerset and Devon. Wool fleeces do not need tying with band at all, and the few stations in Victoria, Australia, where it is still done, need not continue the practice. Then there is the evil arising from using poor tares. When this is done, the loose, fluffy bits from the inside rub off on to the wool, and no amount of sorting will rid these from the wool. When hemp or jute fibre

gets into the wool and passes through the scouring machine, it gets so broken up that it is lost sight of. These fibres adhere most tenaciously to the wool fibre through all the process of manufacture, and when the fleeces come to be dyed they refuse to take the colour like wool; consequently they come up in the finished article in a very objectionable way, the pieces being specky, which, in dark, solid shades like blacks and browns, completely spoils the piece. Before wool is placed into any tares, they should be turned inside out and well shaken, taking care to conduct this operation away from the shorn fleeces. This is a most important matter, and deserves serious attention at the hands of both home, colonial, South African, and River Plate sheepmen. Paper-lined tares have been suggested as a possible remedy, and no doubt a good deal can be said in their favour. A good quality tare should be used, this greatly minimising the evil.

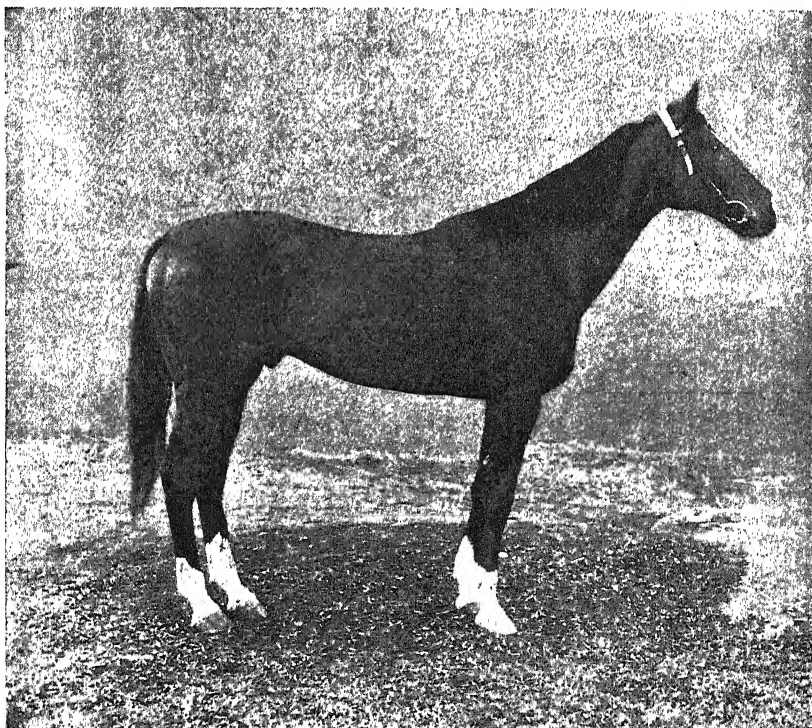
INCREASING COMPETITION FROM ABROAD.

My time has entirely gone, but sufficient has been already said to shew how essential it is that shorn fleeces, no matter where grown, should be prepared for market in a real business-like way. Avoid double cuts, and let there be as long a staple as possible. Remove all the daggings, and sell the objectionable parts, such as the skirts and britch, by themselves for what they will fetch. Growers can rest satisfied that to-day's high prices cannot last for ever, though it is some satisfaction to know that the manufacturing world was never so near the sheep's back as it is to-day. The outlook is still highly encouraging from the wool-grower's standpoint, but in every sheep-breeding country great efforts are being made to increase the number of sheep. The larger the production, and the greater will wools of each country compete with each other in consuming markets. Those grower's clips in the future will command the most ready support which are the best grown, and which are prepared for market in a real business-like way. I would say, in conclusion don't breed anyhow, and don't give us what I call "undenominational" qualities of wool. Remember the adage, "Breed at random, and you'll repent at leisure"; and this is as true of wool as anything else. The outlook is still of a most encouraging character, and without doubt there is going to be a healthy demand for raw material for years to come, at good paying prices. The world to-day wants plenty of good wool, but not wool substitutes in the shape of earth, dung, and other objectionable matter, and this Conference can send out a warning note to sheep-breeders throughout the world not to produce poor fleeces, but wool of first-class quality, good length, sound staple, and in light condition. It is that class of wool which manufacturers want, and that class of material will always sell.

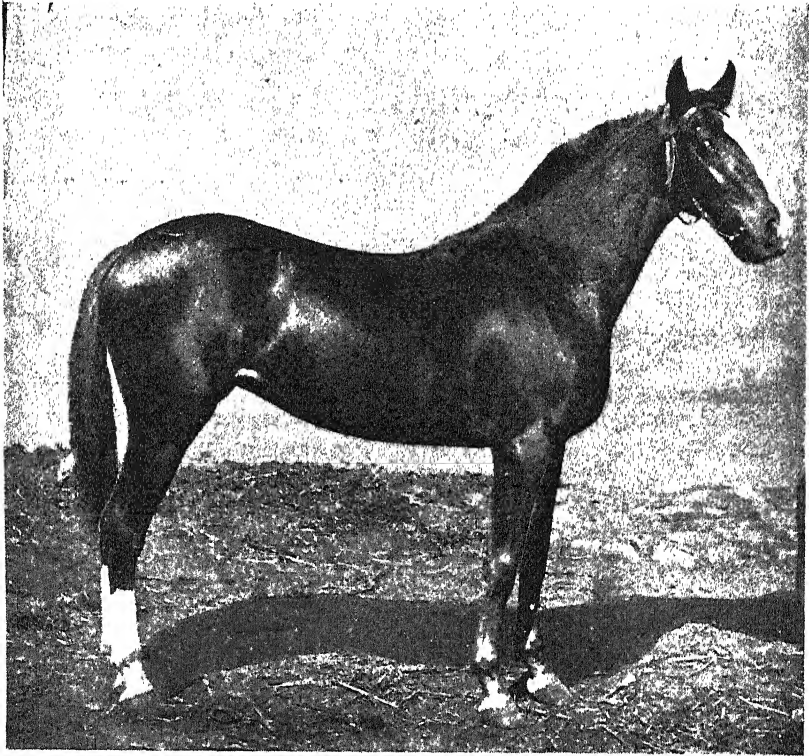
THOROUGHBREDS IN EAST GRIQUALAND.

This Year's Prize Winners.

Griqualand East is far removed from the main centres of stock-breeding enterprise in this Colony and, as a consequence, its progress is not so generally known as it deserves to be. Last month we published some photographs of some of the prize cattle at the Kokstad Show and in this issue we are enabled to reproduce a couple shewing prize winning Thoroughbreds. That section of the Colony, through bordering on the sub-tropical zone which really begins in the coast belt to the south, being continued in Natal, is excellently suited for stock raising, and is justly famous for its horses, cattle and sheep. It is only a question of the country being opened up by railway communication for it to take a prominent place among the leading agricultural districts.



Thoroughbred Stallion "Altitude," the property of Mr. M. F. W. Harley, Kokstad.



Colonial Bred Filly by "Campanajo," the property of Mr. M. F. W. Harley, Kokstad.

The first photograph reproduced herewith shews the thoroughbred stallion "Altitude," by "Bill of Portland," by "St. Simon," the winner of first and champion prizes at Shows in East Griqualand, 1906. The owner is Mr. M. F. W. Harley, of Kokstad. The other is a Colonial bred two year old filly by "Campanajo," and was the winner of first and second prizes at the same Shows. She is also owned by Mr. M. F. W. Harley of Kokstad.

EXTRA-TROPICAL FORESTRY

Being Notes on Timber and other Trees cultivated in South Africa and in the Extra-Tropical Forests of other Countries

By D. E. HUTCHINS, F.R. Met. Soc., Conservator of Forests,
Cape Town.

(Continued from page 28.)

MANGANESE.

Recent experiments seem to shew that a very small quantity of manganese has an important effect as a manure. Bertrand manured a plot of oats with sulphate of manganese at the rate of 48 lbs per acre and obtained a 22.5 per cent. increased yield. With rice Aso in Japan obtained an increased yield of 42 per cent. (*Bul. Agri. de l'Alg. Jan. 1906*).

Manganese is, however, required in such small quantities by agricultural crops (and in still smaller quantities by forest trees), and is so commonly found in almost all soils that only experiments on an extended scale can shew what is the practical use of manganese as an agricultural fertilizer, and if it has any practical use as a forest fertilizer.

LIME.

In Cape Colony one generally finds along the coast, deposits of calcareous sand, together with superficial deposits of limestone formed (and forming under our eyes) from the calcareous sands. The calcareous sands have a marine origin: they are often composed of comminuted shells. At Agulhas, and elsewhere along the southern coast, we see sandstone and limestone in all stages of purity and solidification, sometimes a nearly pure limestone and sometimes a sandstone formed of siliceous particles cemented together with an infiltration of lime in solution. Cape Agulhas itself is no bold headland, but an affair of sand shaped by wind and sea currents, the sand more or less solidified with lime solution into sandstone rocks.

In the South coast of Cape Colony lime occurs in the Malmesbury beds, but usually not abundantly. Over and behind there comes the belt of sandstone mountains and the poor soils formed from their denudation, soils that are too often deficient not only in lime, but in all other mineral plant food. It is in this belt, blessed climatically, but too often cursed chemically, that lie most of our indigenous forests and forest plantations. The valleys and flats are often fertile, but the mountain slopes are generally woefully deficient in lime and the other mineral constituents of a fertile soil. Hence the use of bones and wood ashes supplying phosphates, lime and potash. Sometimes lime can be given more liberally in the form of top-dressings of burnt lime, but generally this costs 3s. or 4s. per bag,

and is too expensive to be used except in special cases, such as lucerne beds.

Trees requiring much lime, such as the Walnut, are not seen along the coast sandstone belt, though no doubt there are places near outcrops of igneous rock where they might be grown in the sandstone belt, but even here the veld fires and heavy rains generally render the top soil poor. Exceptionally favoured localities are Evelyn Valley with its diorite and red loams; and some of the lower slopes of Table Mountain with their granite and red loams, but there is not much lime even in the granitic soils.

Inland of the belt of sandstone mountains occur the rich soils of the Karoo and of the Eastern highlands, getting richer and richer in plant food as, going inland, the climate gets drier and drier. Here lime is abundant, often superabundant. Not only is it plentiful in the soil along with phosphates and potash, but there are vast beds of underlying limestone. Referring to the analysis given above of the karoo veld at Hanover it will be seen how large a proportion of the soil of the Karoo veld is carbonate of lime. Nearly all of the two items "volatile matter" and "lime" represents ordinary limestone or carbonate of lime. These amount to from 40 to 60 per cent. of the whole.

Nine samples taken from the Muizenberg dunes and the Vlei behind them yielded the following quantities of lime.

The following table gives the percentage of Lime in each available as plant food.

<i>No. of Sample.</i>			<i>Lime</i>
1.	Muizenberg	...	5·016 per cent.
2.	"	...	11·060 "
3.	"	...	6·278 "
4.	"	...	7·673 "
5.	"	...	5·289 "
6.	"	...	1·51 "
7.	"	...	3·453 "
I.	Sandvlei	...	5·737 "
II.	"	...	9·126 "

J. MULLER.

Analyst.

15 PER CENT. OF LIME KILLS CLUSTER PINE.

The following analysis by the late Mr. J. C. Watermeyer Government Analyst, is from the other side of False Bay at Eerste River. Here the practical result of the heavy percentage of lime in the soil was that an extensive stock of young cluster pines turned brown the second year and in two or three years were all dead.

Eerste River Sands.

In his report dated 26th June, 1893 Mr. Watermeyer one of the Government Analysts says:—The soils are all very rich in lime; this advantage is, however, to a certain extent counterbalanced by the presence of excessive quantities of chloride of sodium or common salt.

The percentages of substances available as plant food, are as follows.

	No. 1.—Surface drift sand.	No. 2.—Drift sand 3 ft below surface.	No. 3.—Surface soil after drift sand has passed over.	No. 4.—Soil 1 ft. below surface where dr f sand has passed over.	No. 5. New deposit formed during summer, 1892.	No. 6.—Old deposit.	Mean.
Moisture ..	·38	·40	·36	·58	·44	1·28	·57
Ammonia ..	·004	·003	·003	·003	·003	·003	·003
Chlorine ..	·11	·002	·016	·007	·014	·14	·027
Phosphoric oxide	·09	·04	·07	·04	·01	·01	·04
Calcic oxide ..	15·98	18·50	16·27	11·56	15·57	18·66	16·09
Magnesian oxide	1·11	1·42	·78	·22	5·21	4·95	2·28
Oxide of iron ..	·17	·25	·21	·21	·25	·32	·23
Potassic oxide ..	·24	·12	·26	·20	·16	·28	·21
Sodic oxide ..	1·16	·63	·66	·82	1·00	·80	·89
Sulphuric oxide	·21	·21	·13	·11	·21	·21	·18
Carbonic oxide ..	13·87	15·16	13·64	7·25	14·90	18·31	14·18

This may be compared with the analysis of the Port Nolloth sands where it will be seen the percentage of lime is much less. In the Cape Peninsula the sand on the Atlantic side contains but little lime, but the lime in the sand on the False Bay shores is too much for the growth of cluster-pine. This may be due to the fact that the sand on the False Bay side has been recently blown up by the south-easters from the sea and is largely composed of broken shell.

After the lapse of sixteen years there has just been made a further analysis of the Eerste River sand that killed the Cluster-pine, *P. pinaster*. This analysis gives 18·18 per cent. of lime.

PORT NOLLOTH SANDS.

Samples taken by Mr. A. W. Heywood in June 1893.

No. 1. Surface south drift Port Nolloth.

No. 2. Surface north drift Port Nolloth.

No. 3. 1 ft. below original surface.

	No. 1.	No. 2.	No. 3.	Mean.
Total Phosphoric Acid ...	0·16	0·18	0·03	0·12
Directly assimilable Phosphoric Acid ...	0·14	0·10	0·02	0·09
Potash ...	0·029	0·036	0·063	0·042
Lime ...	1·44	2·07	0·80	1·44
Sulphuric Acid ...	0·037	0·041	0·017	0·02

J. F. MARAIS, D.Sc.,
Analyst.

LIME AS A FERTILISER.

Lime as a fertiliser is particularly useful for vlei and sour mountain ground and for vegetable soils generally. It neutralises the acids that are often met with in these soils. For this purpose unburnt lime may be used, provided it can be got in a powdery state. Other chemical changes in the soil are induced by the use of lime in the caustic state, *i.e.*, fresh burnt lime. But for such a purpose as liming lucerne beds, or sample plots of lime-loving trees, such as *Eucalyptus gomphocephala* or Walnut, unburnt lime, provided it be not too coarse, would be preferable in the case of ordinary loams. In lucerne beds I have used both burnt and unburnt lime with the best effect.

In the dung heap and compost pit, lime is specially useful, since it forms nitre or saltpetre, a valuable nitrogenous manure, but one which is generally far too expensive for Foresters to buy.

It should be borne in mind that when the expression lime occurs in an analysis, quicklime (CaO) is usually meant; not Calcium (Ca) or Carbonate of lime (CaCO_3).

In European countries, and to some extent in the United States, lime has been used with marked benefit in improving certain classes of soils, notably those of granitic origin, which are poor in both phosphates and lime. One of the useful bulletins issued by the Department of Agriculture, Washington, is on the use and practice of liming.

On the very sour veld of the Concordia plantation at Knysna, lime was used systematically and for some years with the best results, both by myself and by the late conservator Mr. Cooper. Here it was necessary to go to some expense in improving the soil for arboretum purposes. These experiments will be found described in the Forest Blue book for 1890.

FARMYARD MANURE, THE ALL-ROUND BUT WEAK
FERTILISER.

The all-round fertiliser that supplies every kind of plant food and one that at the same time renders a clay soil more open and a sandy soil less open is farmyard manure. But farmyard manure is essentially a poor manure; it contains but small quantities (from 1 to 2 per cent.) of Phosphate, Potash and Nitrogen; sometimes not more than the double of these ingredients in a normal fertile soil.

When animals consume vegetable products they permanently attach a small percentage of the Phosphates, the Potash, the Lime and the fixed Nitrogen, and pass off the rest in their excrements, ready for plants to take up again. Nearly all the Phosphates are in the solid excrement, and Potash in the liquid. The larger part of the Nitrogen is in the liquid excrement.

READILY AVAILABLE FERTILISER IN FARMYARD MANURES.

Of the fertilisers present in farmyard manure but a small portion of it is in a soluble or immediately available form. It is thus, particularly as regards its Phosphates, a lasting manure.

The readily available fertiliser in farmyard manure is mostly in the urine. The amount of readily available fertiliser in a ton of manure is small, only about 20 lbs.

As a mnemonic, one may picture a farmer escorting a Scotch-cart load of stable manure and carrying a spade and fork. If the cart contains half a ton, and if the farmer's spade and fork weigh together 12 lbs, the weight of the spade and fork represents the weight of readily available plant food in an average sample of stable manure, provided the manure be rich and fairly dry. But poor stable manure soaking wet and half washed out, such as one often sees being carted about during winter in the Cape Peninsula, would not contain more than half this weight of readily available plant food, or, say, the weight of the farmer's spade alone! To repeat, in a load of stable manure the actual weight of readily available fertilisers varies from the weight of the farmer's spade to that of his spade and fork.

ANALYSES OF ENGLISH FARMYARD MANURE.

"The quantity of moisture naturally varies most, and this variation will depend on the age of the manure, and the conditions under which it is permitted to decay. It may be taken at from a minimum of 65 per cent. in fresh, to 80 per cent. in well-rotted manure. The total organic matter may be taken at from 13 to 14 per cent., containing Nitrogen .4 to .65 per cent. The total mineral matter will range from about 4 to 6.5 per cent containing of Potash from .4 to .7 per cent., and of Phosphoric acid from .2 to .4 per cent." (*Manures and Manuring*.—Aikman.)

This shows how small a proportion of the three fertilising ingredients is actually contained even in the dung of well fed animals such as have made this English farmyard manure. The minimum figures are only double the Potash and Phosphates in a normally fertile soil which, we have seen, may be averaged at Phosphoric acid 0.1 and Potash 0.2.

The above figures averaged and abstracted give

Nitrogen	...	...	0.52 per cent.
Potash...	...	...	0.55 "
Phosphoric acid	...	...	0.30 "
<hr/>			
Total	{	...	1.37 "

This equals 27.4 lbs. per ton of 2,000 lbs.

This may be compared with the analysis given below for wheat straw dung:

Nitrogen	...	...	0.61	per cent.
Potash...	...	...	0.59	"
Phosphoric acid	...	...	0.43	"
Total	...	...	1.63	"

This equals 32.6 lbs. per ton of 2,000 lbs.

The composition of an average sample of well-rotted farmyard manure may thus be stated at:—

Water	...	...	80	per cent.
Organic matter	...	...	14	"
Mineral matter	...	...	6	"
			100	"

Of this small percentage of mineral matter only a portion is Phosphates or Potash. The total of Phosphates, Potash and available Nitrogen varies between 1 and 2 per cent. The total average amount of Phosphates in a ton of stable manure is stated at 6lbs.; of Potash 10 lbs.; and of Nitrogen 11 lbs. This accords with Aikman's average figures quoted above. It is important to try to remember just what one gets of the chief fertilisers in a load of stable manure.

To return to the mental picture of the farmer and his spade weighing 6 lbs. escorting a Scotch-cart load of manure (half a ton), one may remember that the weight of the spade represents:—

Rather more than all the Nitrogen.
1 lb. more than all the Potash.
Double the Phosphate.

This shews how weak in Phosphates, Potash, Nitrogen and Lime is farmyard manure. The total amount of plant food in a ton of average stable manure is altogether less than 100lbs.

To use stable manure to the best advantage it should be strengthened with such of these four necessities as the soil, plant or tree may require. If we analyse the mineral matter of plants and trees and test their growth with various fertilisers it will be seen that to supply the mineral matter they require, stable manure should be strengthened with Phosphates and sometimes with Potash, while for garden and field crops more Nitrogen is required. Nitrogen seems specially necessary in Europe and cold countries and Phosphates in South Africa. In the Tokai Oak nursery and in the Tokai arboretum it is Phosphates strengthened with ground and burnt bones that have produced the best results. This is with poor sandy ground.

In the Government Oak nurseries at Ceres Road, on similar poor sandy soil the same good results have been obtained, by the use of stable manure strengthened with ground burnt bone.

Oak transplants which on the unmanured ground shew a poor growth and little fibrous root growth, on the manured ground shew a good straight vigorous growth, and the roots come out with a fine crop of rootlets and fibres. Such a sapling transplant will, while an oak sapling grown in poor soil, shew the long pipey roots of the starved tree. In transplanting, the long pipey roots must necessarily be cut and the oak sapling will probably die when transplanted.

KRAAL MANURE.

We come now to a form of manure which has been a good deal used by fruit-tree planters and which is brought down from the Karoo by the Railway at very moderate rates. Kraal dung or "mest" represents the droppings of farm animals—sheep, goats and cattle, trodden down into a firm mass and more or less dry. It is without the litter or bedding which forms so important a part of stable manure. It comes from a dry climate and the water which forms from 70 to 80 per cent. of the weight of stable manure is more or less absent. In the analysis given below there was an average of only 13 per cent. of water. In the Kraal dung that is cut out into large square cakes and sold for fuel the water is nearly all gone, and we have practically a substance that is entirely different to ordinary stable manure, and as a fertiliser very much stronger. It is probably the best fertiliser for most of the fertile coast districts, provided it can be obtained at moderate rates from not-too-distant Karoo farms. Its carriage represents the best form of Railway traffic, in that it adds directly to the productiveness of the country. Fertilisers are little wanted on the rich Karoo soils, while in the better-watered coast country, it is only fertilisers that are wanted to produce crops equal to any country in the world.

Analysis of 10 samples of average air-dry Karoo.

Kraal Dung.

Nitrogen	...	...	1.33 per cent.
Potash...	...	...	3.02 "
Phosphoric acid	...	...	1.29 "
Total	...	...	5.64 "

This equals 112.8 lbs. per ton of 2,000 lbs.

This sample contained on an average only 13 per cent. of moisture, consequently it yielded on burning as much as 42 per cent. of ash.

SOUR-VELD KRAAL DUNG.

As a comparison I add an analysis of one sample of Kraal dung from a wettish coast district—Swellendam. There is more water in this sample of kraal dung and it is formed by the dung of animals grazing, not on the rich Karoo herbage, but on the poor herbage of "sour veld." These are poor figures when compared

with sweet-veld kraal dung, but rich figures when compared with stable manure.

Nitrogen	...	...	1.12	per cent.
Potash	...	...	1.06	"
Phosphoric acid	...	...	0.27	"
Total	...	...	2.45	"

This equals 49.0 lbs. per ton of 2,000 lbs.

Thus we see that the poorest South African Kraal dung contains nearly twice as much fertiliser as average stable dung. This superiority lies in its Nitrogen and Potash. Stable manure is dung mixed with litter. Kraal manure is dung partially dried and rewetted with urine: it is the urine that makes it so rich in Nitrogen and Potash.

LASTING EFFECT OF FARMYARD MANURE.

Says Dr. Fream in the Royal Agricultural Society's *Text-book of Agriculture*:—It is characteristic of farm-yard manure to leave in the soil a large though slowly available residue of food at the disposal of future crops. It is the nitrogen of the liquid excreta of animals that is first rendered useful to plants within the soil, then that of the finely divided matter which passes intermixed with some secretions in the solid excrements, and lastly that of the litter.

This has an important bearing on the two systems of orchard cultivation practised in South Africa, viz., (1) the old Cape plan of cultivating the soil of the orchard with green barley during winter and (2) the California plan of keeping the ground clean. In the case of poor light soils a heavy winter rain and a liberal use of manure the crop of barley must put more into the soil than it takes out, and this is the experience of most people who have cultivated green barley or Nepaul Wheat round fruit trees. White crops such as Oats do not answer the same purpose, since they are reaped later and dry up the soil too much. Green barley not only leaves the residue of the stable manure in the soil, but the rich mass formed by the decaying roots of the barley.

Similarly in planting a grove of Oaks or other trees where the trees are put in far apart for purposes of ornament or fruit, as long as the ground is not too much shaded by the up-growth of the trees it is better to keep it cultivated with green barley during winter. This will gradually and permanently enrich the ground and the cost of the manure will be paid for in the green barley.

FARMYARD MANURE—DETAILS.

To go more into detail with regard to the nature of the dung of various animals we have to consider:—

- (1) The food.
- (2) The animal.

The food is of more importance than the animal. Just what the animal eats will be

the value of its dropping less a small percentage. Thus fish eating birds yield Guano, the grass-eating goose one of the poorest manures. Hence the value of Karoo manure, and sweet veld manure to the sour veld farmer.

Hence, too, the value of good feeding for the farm or forest animals. Good food means not only strong healthy animals but rich dung and good crops. Good feeding is at the bottom of good farming. Therefore when calculating the cost of artificial manures, the cost of good rich feeding should go into the calculation, since the rich food benefits both crop and animals the artificial manure, crops only. The exact manurial value of the various farm foods will be found in the Agricultural text-books. The following list cited by the American Agricultural Department may be given here:—

VALUE OF MANURE IN ONE TON OF FEED.

				£	s.	d.
Wheat Bran ..	..	..	..	3	10	9
Linseed ..	..	..	..	3	3	8
Cow Pea Hay..	..	..	..	2	13	11
Lucerne Hay ..	..	..	..	2	3	9
Barley ..	..	..	..	2	1	10
Maize Fodder..	..	..	..	1	15	7
Maize ..	..	..	..	1	15	0
Oathay ..	..	..	..	1	13	10
Oats ..	..	..	..	1	13	3
Barley Straw ..	..	..	..	1	2	10
Wheat Straw ..	..	..	..	0	15	1
Cow Pea Vines—Green	..	..	..	0	10	6
Oat Straw ..	..	..	..	0	9	9
Sorghum—Green	..	..	..	0	8	6

DUNG OF VARIOUS DOMESTIC ANIMALS.

The following particulars regarding the relative value and peculiarities of the dung of various domestic animals are extracted from a work that should be in the hands of every practical Forester and Farmer, namely *Manures and the Principles of Manuring* by C. M. Aikman, 1894. For Foresters who keep domestic animals—and what Foresters do not?—I reproduce the following extracts:—

URINE.

The most valuable urine, weight for weight, is that of the sheep, as it contains the largest amount of alkali; (including potash) and nitrogen: the urine of the horse comes next; then that of the cow, while that of the pig is the poorest.

While the solid excreta consist, of undigested food, the urine contains the manurial ingredients of the food which have been digested by the animal system.

Generally speaking, we may say that the nitrogen originally present in the food suffers very little loss in passing through the animal system, and that practically speaking, the ash constituents suffer no loss whatever.

As to the distribution of the manurial ingredients, much will depend on the nature of the food. Almost invariably more than a half of the total nitrogen excreted will be found in the urine, in many cases very much more. Of the mineral constituents, about a third on the average may be said to be excreted in the urine. Of this mineral matter it may be noted that nearly all the alkalis (potash and soda), or about 98 per cent. are found in the urine. Of phosphoric acid and lime, on the other hand, there are the merest traces in the urine. Horse urine, however, is an exception with regard to lime, as it contains about 60 per cent of the lime consumed in the food.

LIQUID MANURE;

Diluted with six or eight times its bulk of water, urine may be applied without fear of injury to young plants as a top dressing. This form of liquid manure seems quite as good as the ordinary liquid manures formed by putting stable manure or guano into a barrel of water. It gives the plants potash and nitrogen; to complete it a little superphosphate should be added.

It may be mentioned here that diluted urine is occasionally used for dousing orange trees as a remedy against scale, and apparently with success. }

SOLID EXCREMENTS.

The solid excrement of the sheep, is weight for weight, the most valuable as a manure, as it contains more nitrogen and phosphates than the others, and at the same time is much drier.

If, however, we compare the composition of the solid excreta in a dry state, we shall find that the following are the results (basing our calculation on Stoeckhardt's analyses) :—

			Nitrogen.	Phosphoric Acid.	Alkalies.
			Per cent.	Per cent.	Per cent.
Horse	..	..	2.08	1.45	1.25
Cow	..	..	1.87	1.56	0.62
Pig	..	..	3.00	2.25	0.50
Sheep	..	..	1.78	1.42	0.71

It will be seen from the above that the dry substance of the solid excreta of the pig is richest in fertilising substances. Too much stress, however, as has already been pointed out, must not be put on any single analysis, as so much depends on various conditions, especially the food.

The quantity of dung voided by different animals varies : thus the cow exceeds the horse in quantity of dung.

HORSE DUNG.

The composition of horse-manure is perhaps the most uniform of all the manures produced by the different farm animals. This is due to the fact that the food of the horse is generally of the same kind, consisting of oats, hay and straw.

The total excrements voided by a horse in a day have been calculated, according to the average of experiments by Boussingault and Hofmeister, at 28.11 lb., of which only 6.37 lb. consisted of dry matter. These 28.11 lbs. contained .18 lb. of nitrogen and .92 lb. of mineral matter. The amount of straw necessary to absorb this amount of excrement may be stated at from 4 to 6 lb. The amounts of nitrogen and mineral matter in 4 lbs. of straw are .01 and .23 lb. respectively. The total amount of nitrogen and ash, therefore, in the farmyard manure produced by a horse in one day, would be .19 lb. nitrogen and 1.15 lb. mineral matter : or, if we take the larger quantity of straw, somewhat more.

Taking these figures, we find that the amount of manure produced by a horse in a year will be from 11,720 to 12,450 lbs. (i.e. from 5½ to 5½ ton), containing from 69 to 73 lbs. nitrogen, and from 420 to 460 lbs. mineral matter.

Horse dung being, comparatively speaking, of a dry nature, it is extremely difficult to effect its thorough mixture with the litter. For this reason the manure formed from horse excreta is particularly liable to rapid fermentation. In the process of fermentation the nitrogen is converted into carbonate of ammonia. As nitrogen in this form is of an extremely volatile nature, the risks of loss from this source are considerable. As illustrating this fact, it may be mentioned that Boussingault has found by experiment that the total percentage of nitrogen contained by fresh horse manure might be reduced in the process of fermentation to one-half of its original amount by loss from this source.

COW DUNG.

The composition of the manure formed from the excrementitious matter of the cow is very much less constant than is the case in the horse-manure. An average statement of that composition is therefore very much more difficult to obtain. The number of analyses available for the purpose of forming this average is, however, very large. The manure produced by cows contains a large percentage of water. This is due to the large quantity of water they drink. It has been estimated that milch cows drink along with their winter food, for every pound of dry substance, 4 lb. of water, and in summer about 6 lb.

According to some experiments by Boussingault, the excrements of a cow in a day mounted to 73.23 lb. of which only 9.92 lb. were dry matter. These excrements contained .256 lb. of nitrogen and 1.725 lb. of mineral matter.

Cow-dung is, owing to its more watery nature and poorer quality, very much slower in its fermentation than horse-dung. When applied alone, cow-manure is very slow in its action, and makes its influence felt for at least three or four years. It is difficult to spread it evenly over the soil, owing to the fact that, when somewhat dried, it has a tendency to form hard masses, which, when buried in the soil, may resist decomposition for a very long period. The cause of this is due to the presence of a considerable amount of mucilaginous and resinous matter in the solid excreta, which prevents the entrance of moisture and air in to the centre of the mass. This tendency of cow-manure to resist decomposition will be greatly lessened in the case of the excrements of a cow richly fed.

Manures and Manuring.—C. M. ATKMAN.

DUNG OF POULTRY AND PIGEONS.

Compared with well-rotted farmyard manure, there are 48·60 lb. of phosphoric acid in hen manure to 6 lb. in farmyard manure; 41 lb. of potash, to 10 in farmyard manure; and 67 lb. of nitrogen to 11 in farmyard manure. This analysis is based on a ton each of hen and farmyard manure.

Agricultural Gazette of New South Wales.

It is stated that a dozen fowls per acre will yield sufficient dung to fertilize the acre enough for most crops, especially if the poultry dung be strengthened with a little phosphate.

A practical farmer wrote thus to the *Live Stock Journal*:—"There is still the most important item to mention—so far as farmers are concerned—the manure. I have this year fully tested its value both for corn and root crops. I dressed a ten-acre field of oats in four two-and-a-half-acre lots, alternately with artificial top dressing at £9 per ton, and poultry manure, in equal quantities, and if there was any difference it was in favour of the poultry manure."

It has been calculated that the manure dropped by fowls from their perches at night represents a manurial value of from 6d. to 1s. per bird per year.

Pigeon dung besides having a use in the arts has been highly valued as a manure. The Romans set great store upon it. Modern analyses and the experimental use of pigeon dung do not, however, support the Roman estimate of its value.

The dung of either fowls, pigeons, ducks or geese has not the high value one would expect from the guano analogy.

SWISS MILCH GOATS.

How They are Obtained and Their Cost.

Messrs. Cockbain, Hemelryk & Co., of 4, Lloyd's Avenue, Fenchurch Street, London, E.C., having noticed the correspondence referring to Swiss Goats in recent numbers of the *Agricultural Journal*, write to say that they are prepared to place their services at the disposal of anyone desirous of purchasing these goats. Their correspondent in Switzerland states:—"The present approximate prices for Toggenburg Goats for breeding are: For Rams 70 francs, Ewes 50 francs. The total average yield of milk per head is about 600 to 700 kilos per annum (one liter weighs very little over a kilogramme). Of course this varies very much. I have seen in the statistics, which are officially controlled here for instance, one goat which has in one year only yielded 412 kilos, and another one with 1,015 kilos. Autumn is the only suitable time for transport, summer is too hot, winter is too cold, and in spring the animals are hardly strong enough for a long journey." The following particulars taken from a paper read by Mr. Bryan Hook before the British Goat Society gives information with regard to these animals, and how they are obtained:—

IN SEARCH OF GOATS IN THE TOGGENBURG.

The Toggenburg Valley is situated in the Canton S. Gallen, in Switzerland, just to the south of Lake Constance. Though seldom traversed by the British tourist, it is a district of uncommon interest and beauty.

My first step on arriving in S. Gallen was to search out a gentleman to whom I was directed by Mr. Thomas; this was Herr Wysman, director of the Milk School of Sornthal.

The Swiss have arrived at a pitch of perfection in State Socialism. One of the State aids to husbandry is the granting of prizes or subsidies to the owners of the best cattle, pigs, and goats. Part of Herr Wysmann's duties led him to attend in each village in the canton at an annual show for the purpose of awarding these subsidies, and thus he naturally possesses a most complete knowledge of the animals that are owned in the canton.

He was most courteous and took great pains to explain to me where I should find the best goats, and by his advice I went to the higher end of the valley and took up my quarters at the Hotel zum

Sternen, Unterwasser. Here I was entertained plainly, but with all necessary comfort and absolute cleanliness. I had a large bedroom, and from my bed could look full upon the snowy slopes of the Säntis Mountain. My entire charges amounted to four francs a day—wine the only extra.

The only drawback to my perfect enjoyment was the ignorance of the language—an incomprehensible *patois* of German. Fortunately the hotel-keeper's son spoke excellent French, and he was good enough to be my companion in most of my walks and to make my bargains and arrangements.

The peasants of the Toggenburg are mostly employed in the manufacture of what is known as the Appenzell muslin embroidery, and it is these weavers that are the principal owners of the goats, each family possessing only enough animals to supply their own daily needs.

These several animals are united with others to compose a village herd, placed under the charge of a common herdsman, whose duties cease only when he has housed the herd in the large shed that makes their sleeping shelter, and where each owner is expected to attend morning and evening for the purpose of milking.

The excellent quality of the milch goats of this district is, I take it, owing to the fact that here they are kept almost entirely for the sake of their milk. In other districts, notably in the higher pastures of the Rhone Valley, the goats are kept in herds of several hundreds, to be killed and used as mutton. From these herds the best milkers are selected for supplying milk, and the kids of these probably killed and eaten to save milk and trouble. Thus the forces of selection are rather against the perpetuation of exceptional milking qualities.

The peasant weavers of the Toggenberg have, however, been for centuries working upon different lines. No large herds are kept for killing merely, but small numbers are, under many different owners, kept with a view entirely to their milking qualities. The kids of the best milkers are most valued, and any goat that shewed a deficiency in milk production would not be called upon to increase the herd a second time, but be soon converted into mutton.

Probably some of the most productive milkers in the world are to be found amongst the English or cross-bred goats in this country, with their careful management and high feeding, but it is, on the other hand, certain that such animals are rather the exception than the rule in England.

Such, however, has been the effect of selection in the districts I am describing, that the goats have reached a universal standard of excellence equalled in all probability by no other herds in the world; and this with no artificial feeding whatever, for, with the exception of a little coarse hay in winter, the goats are entirely dependent upon the pastures of the mountain sides.

The only difficulty which presented itself in the selection of the goats was the fact that by far the larger number of animals were more or less long haired. The natives prefer a certain amount of shaggy coat, as they consider that it forms a protection against the wet and cold of their climate, which is a rigorous one, for the bottom of the valley is some 3,000 feet above the sea.

The males that I saw were all quite long-haired, though of large size and fine shape. It is the males only that receive the State subsidy, but Herr Wysmann informed me that he was in hopes it would soon be extended to the females.

In awarding the subsidies, I understood that the most valued point is purity of breed as demonstrated by the perfect correctness of the markings.

The breed of the neighbouring canton of Appenzell is also largely kept, it being preferred by some because its pure white makes it a conspicuous object at a distance. This breed is also eligible for the competition for subsidy provided it is pure bred, but the authorities discountenance all crossing of the two races.

In the neighbouring canton, in and around the towns of Appenzell and Gais, are various goats' milk cure establishments.

The patients are, I understand, mostly Swiss and German, but, as I did not visit any of the establishments, I cannot give you details of the treatment. I was, however, informed by Herr Wysmann that the goats which supply the milk are mostly of the white Appenzell breed.

Allow me to quote again from one of my letters home.

"My afternoon yesterday was a great success. I drove with Herr Looser to Neslau, where he left me, promising to call for me again on his return journey. Mine hostess of 'The Vine' sent for a jolly good-natured old chap, who had promised to shew me round.

"With a grand blue umbrella in one hand and a stick in the other, his shirt-sleeves rolled up, and bare-headed, he trudged on in front, his close-cut grey hair sticking out straight from his beaming good-natured face.

"Having been duly instructed by the French speaking landlady, he proved an excellent guide, and led me for three hours over the mountains from one tiny homestead to another. He shewed me plenty of goats, and in the search I got many delightful peeps into the way these people live, which one would never get otherwise.

On our way back the rain descended in torrents, and we splashed down the mountain side under our respective umbrellas, and reached 'The Vine' in time to enjoy some *café au lait* and bread and honey before starting on our way back here."

The hardships of my journey commenced with the return home, and this, indeed, was no trifling task. Each animal before it was allowed to be moved had to be accompanied by a certificate

of health, signed by the mayor of the village in which it was bought. Added to this, the French Customs required two other certificates for each, which, as I said before, I failed to have in proper order, so that when I reached the French frontier, after 36 hours' travelling, the Custom House officers stoutly refused to let me pass. To get the certificates would have taken me three days, so it will be understood that I did not accept the situation with meekness.

After some hours of argument in the lamest of French and a great deal of heat on both sides, I was eventually allowed to proceed on the understanding that the animals were booked through to Havre, and shipped at once to Southampton.

Probably no one here present has ever taken a long journey in a *train omnibus*, the only conveyance by which my animals could be booked. The "train omnibus" stops at every station, and the only advantage of it is that if you get tired of sitting you can get out and walk.

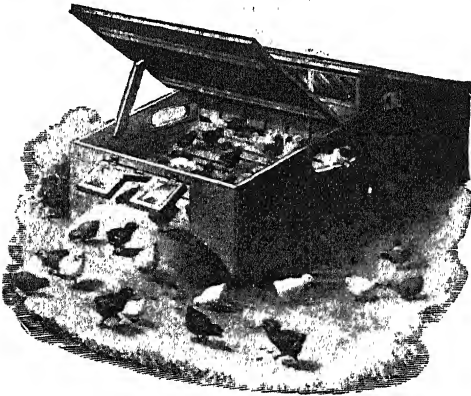
My amusement by the way was to travel now and then in my horse-box and milk and feed my goats, but by the time we reached Havre, after three days and two nights of the "train omnibus," both my goats and I were in a very limp condition and I have seldom enjoyed more thoroughly the luxury of going to bed than the night we crossed over to Southampton.

POULTRY FOR PROFIT.

Chapter IV.

BROODERS AND HOW TO WORK THEM.

In choosing a brooder there are several important points to be considered, viz. :—It must be easily heated and easily cleared, it must be storm, vermin, and rain proof. The heating arrangement must be made so that it is impossible for the fumes from the lamp to get into the chick chamber. Like incubators there are many patterns, but I will not take up valuable space and the time of the readers by describing the different patterns. I have used for the past four years a brooder called the Cyphers style A brooder this brooder cost me £5 5s. and has not cost me a penny for repairs during the above mentioned period. Below is an illustration of the brooder. It will easily be seen that this is a useful brooder,



it may be depended on to do its work at all times. This brooder is made of $\frac{7}{8}$ inch boards tongued and grooved and is styled a three apartment out-door brooder. The stove fits on a slide underneath the night nursery as it is called. The heating arrangements of this brooder are very complete and thoroughly reliable. The stove is made of brass and fits under the heating drum.

The chicks are protected from the heating drum by the chick guard, that is a circular piece of wove wire mesh which surrounds the drum. Outside this is what is called the hover, that is an arrangement of felt under which the chicks can nestle and be quite warm and comfortable. The other side of the brooder is called the day nursery and is usually strewn with chaff about half-an inch deep.

In this brooder therefore the chicks can suit themselves as to heat. Under the hover, if the heat is 90° it will be about 80° to 85° and in the day nursery the heat will be about 70° or 75°. The brooder is rain proof and storm proof, being covered with sheet iron. It is also fire proof. The stove is strongly made and the chicks are protected from excessive heat by heavy galvanised sheet iron which is under the floor of the night nursery. The fumes, or smoke from the stove (should the stove wick be turned too high) can not get into the chick chamber as they are carried away from the brooder by a tube which leads out of the heating drum. The stove is easy of access as it fits on a slide provided for the purpose which brings it within reach easily replaces it in its proper position. It has a capacity for 75 to 100 chicks and it is my opinion, all that a brooder ought to be. As regards working the brooder, I find it is not necessary to keep the stove working all day unless during exceptionally cold weather. I usually light the stove about three o'clock in the afternoon and by sun-down the brooder is warmed through for the night. In working the brooder the following "Brooder don't's" as printed in the book sent with the machine is the best advice I can give.

Don't use a short wick.

Don't let the chicks get chilled.

Don't let the chicks get lazy; keep them busy. That is feed them in litter sprinkled on the floor of the brooder.

Don't turn the flame too high it will make your stove smoke.

Don't forget chicks require shade as well as sunshine.

Don't let the chicks get far away from the brooder, provide a run for them.

Don't overheat; too high a temperature weakens the chicks.

Don't neglect the stove; fill and trim it every day.

Don't overcrowd.

Don't close the brooder too tightly at night; chicks requires fresh air night as well as day.

Don't let the chicks get too hungry; feed a little at a time (in litter) and feed often.

Don't fail to air and sun the brooder daily.

Don't trust chicks in a cheap home-made brooder; it kills chicks quicker than a good incubator can hatch them.

I am indebted to Messrs. Geo. Findlay & Co. for illustrations of the brooder. Next month "Poultry Houses and Fixtures".

SHAMROCK.

THE MANURING OF FRUIT TREES AND VINES.

BY I. TRIBOLET, Viticulturist and Orchardist, Elsenburg
Agricultural College.

(Paper read before the Paarl Farmers' Association.)

Although a good deal of intelligence, study, and experimental work has been put into the manuring of nearly all the plants that man grows, either for his use or for his pleasure, this art has as yet not reached the point of an exact science, nor will it ever do so on account of the variation of the factors with which we have to deal. By chemical analysis you can find out almost exactly what your plants take out of the soil in coming to maturity and in bearing their crops. By the same means you can find out what your soil contains in the way of the requirements of these plants. If such is the case, one is inclined to ask: Why not add to your soil the exact amount of the constituents in which it is lacking, and obtain the maximum amount of return from those plants? This is the end to which all scientific manuring tends, but as I have already stated, there are one or two factors which prevent this end being attained with the mathematical precision that would enable us to designate the art or science of manuring as an exact science. One of the factors that prevents us reaching the desired end, is the varying physical nature of the soil; that means the size and arrangement of the grains of the soil; a sand may be fine or coarse, a clay smooth or gritty, a loam light or heavy, any of these characters may predominate, or they may be blended evenly throughout the whole mass. Another thing that prevents us is the mechanical condition of the soil, by which is meant either its natural condition, or that into which it may be brought by cultivation. These conditions of the soil have a great influence on the amount of plant food assimilated by vegetation even if it be present in an available form. Another thing is that the roots do not come in contact with all the plant food found in the soil, so that very often to get good results even more food has to be actually applied in the shape of manure than the plant uses altogether. Then there are the climatic factors: Heat, winds, rain, frosts, etc., over which we have little or no control, and which are hardly ever the same two seasons running.

In some countries the difficulties connected with manuring are less pronounced and more easily overcome than in others, for instance in the wheat growing areas of Australia it has been found from experiment and chemical analysis that the land contains abundance of Nitrogen, Potash, and Lime. All that is at present required to get the maximum return of wheat from these soils is to give them

a dressing of from 70 to 100 lbs per acre of Superphosphate or Phosphatic manure that will add 12 to 15 lbs of Phosphoric acid to that area. This remark practically applies to fruit trees and vines in those parts.

Here we have different and more difficult conditions obtaining on account of the more broken nature of the country and the infinitely more varied chemical composition, character, and consistency of our soils. The problem is thus far more complex. Most of you know from experience that the manure giving excellent results in some classes of your soil does not give such good results in others; as Mr. Jack truly said in his last lecture "formulae and recipes for manuring are almost out of the question in this country." To me there seems no way of these problems being finally solved but by each farmer experimenting on his own plantation. First getting it into such a condition of tilth that any manures or fertilizers he applies may have a chance of producing the best possible effect, keeping an exact record of the results obtained, adding a little more of this and a little more of that till he gets the maximum result from the minimum of cost.

After these few general remarks I will now treat more directly on the subject in hand viz:—"The manuring of fruit trees and vines."

They, like other plants, depend for their growth upon different food constituents found in the soil and in the atmosphere, the principal of which are Nitrogen, Phosphoric acid, Potash, Lime Iron, Soda, Magnesia, and a few others; of this list we need only take into consideration the first three or at the most four viz:—Nitrogen, Phosphoric acid, Potash, and Lime, the rest are invariably found in the soil in sufficient quantities. It might be interesting and perhaps useful to give here the tabulated results of a series of experiments made last year in America of the total amount of different plant food constituents used in one season by the growth of fruit, foliage and new wood on one acre of bearing trees, the amount of plant food used by the tree branches and roots in increasing their size is not included in these results.

AMOUNT OF PLANT-FOODS USED PER ACRE.

Variety of Trees.	Nitrogen.	Phos. Acid.	Potash.	Lime.
	Lbs.	Lbs.	Lbs.	Lbs.
Apple	51.5	14.0	55.0	57
Peach	74.5	18.0	72.0	114
Pear	29.5	7.0	33.0	38
Plum	29.5	8.5	33.0	41
Quince	45.5	15.5	57.0	65
Vines	20.0	12.0	36.0	—
Oranges (fruit alone)	53.8	13.4	55.6	—
Apricots (estimated)	70	12.0	60	100

It will be seen from this table that the Peach tree takes more out of the ground than any of the others, next comes the Quince, then the Orange. These American figures may be somewhat high for this colony, as the crop of fruit upon which they are based is a good deal above the average here. I should reckon about a quarter off. The vines are calculated for a two and a half leaguer crop. Nitrogen and Potash in the case of each kind of tree come nearest in quantity, whilst Phosphoric acid bears a relation of between a third and a fourth to these constituents. The amount of Lime in most cases approaches the Potash.

Most granitic soils especially when of a clayey nature are deficient in Phosphoric acid and lime, and although lime may be in the soil in sufficient quantity for the actual food required by the plant, a dressing of this material now and then tends to sweeten the soil, liberate the potash, and make available the organic matter locked up in the soil. Applications are especially beneficial when farm-yard manure has been used for several years in succession or in alluvial soils rich in organic matter. Light soils are as a rule not so much benefited by the application of lime. Lime is particularly important in stone fruits, it strengthens the stem and woody portions of the tree, shortens the period of growth and hastens ripening. In the application of manures to fruit trees and vines, although they use a lot of nitrogen, it is generally given in excess and has a tendency towards over production of wood and foliage causing a late season and badly coloured fruit. The amount of growth trees make and the colour and length of time the foliage remains on, are good indications as to whether the orchard or vineyard requires a dressing of this manure. The application of nitrogen often does more harm than good. When trees appear to be lacking nitrogen it is often tillage and moisture they require rather than nitrogen. Besides this is one of the most expensive manures, costing at present 18s. per unit of 20 lbs. or £14 8s. per ton in the shape of nitrate of soda. So that where possible I should advise green manuring with leguminous plants such as peas, beans, vetches, clovers, etc., wherever nitrogen is required. These plants, as you no doubt know, have the power of abstracting nitrogen from the atmosphere, and fixing it through the instrumentality of the little nodules found on their roots. A crop of the plants mentioned sown in the autumn or early winter and ploughed down in spring when in bloom, will not only give you sufficient nitrogen, but also add humus—"That intimate mixture of organic and inorganic matter that absorbs and retains fertilising elements and modifies the chemical and physical properties of soils, so that it absorbs moisture more readily and retains it longer,"—causing improvement to your lands.

The Cow-pea is the quickest in its manurial effects of any green

manuring, and about blooming time will give you, with say a two ton crop to the acre :—

Nitrogen	...	...	25 lbs.
Phosphoric acid	...	...	4 „
Potash	...	...	14 „
Vetch gives :—			
Nitrogen	...	...	26 lbs.
Phosphoric acid	...	...	6 „
Potash	...	...	10 „
Field Pea gives :—			
Nitrogen	...	...	18 lbs.
Phosphoric acid	...	...	4 „
Potash	...	...	14 „

This is in round figures and allowing a crop of two tons of each to the acre.

POTASH.

One of the leading factors in fruit trees and vine manuring is the application of Potash. Although our soils especially the vleis contain a higher percentage of potash than they do of the other inorganic plant foods, it is very often found in a form that cannot very readily be assimilated by plants. Green manuring combined with good tillage would open up the soil and help to render a larger percentage of this material available. Still it is advisable that more be added by an application of potassic manures such as Sulphate of Potash, Kainit etc, or by any of the complete fertilizers such as guano, kraal, stable, or kraal ash.

PHOSPHORIC ACID

can be applied in the form of Superphosphate or Basic slag, and is contained in certain proportions in any complete manure. It is one of those foods that greatly influence the formation of seeds in pome fruits and kernels in stone fruits. Since manuring has been placed on a scientific basis, more attention has been given to the application of this plant food than hitherto, and it is generally considered, especially in vine manures, that the proportion of phosphoric acid in relation to nitrogen has not been sufficient. Coste Floret, who has carried on experiments in the matter of manuring vines for over eighteen years, says in reference to this point :—“ That the main benefits derived from Phosphatic manures on vines are 1st : They cause the fruit to set better at flowering time. Non-setting is frequently due to want of phosphorus, the great regulator and basis of seed nutrition. The seed is the fruit of the vine the object for which nature provides the berry. 2nd. They increase the percentage of sugar in the juice and thus in many cases the quality of the wine. Choice wines are much richer in phosphorus than common ones. 3rd. They hasten the maturity of

the fruit. 4th. They regulate fermentation, thus enabling a better and sounder wine to be made. 5th. They cause the wood of the vine to be more robust and to ripen earlier, thus supplying better pruning wood as a start for the following season. 6th. They render the vine much more resistant to fungus diseases. Nitrogen tends to increase those diseases. 'The vine is freer from all diseases in soils well equipped in phosphatic manures.' He considers that more phosphoric acid than the vine requires should be supplied, as it absorbs nitrogen and lime greedily, and takes up potash readily, but phosphoric acid only with difficulty. He prefers manuring little and often, and finds that it is better to supply a complete manure every year instead of large quantities of other manures at longer intervals, and that the quantity of phosphoric acid should be at least double that of nitrogen irrespective of the quantity of nitrogen adopted as a basis for the manure. Other authorities show that in whatever way phosphoric acid is applied, only about half the quantity is assimilated by the vine.

In 1903 and 1904, experiments were carried out by Mr. Mayer, one of our late Government Viticulturists, in the manuring of vines at Stellenbosch, Wellington and Groot Constantia. On Mr. Cillic's farm, Wellington, vines treated with 1 oz. Nitrate of Soda, and 4 oz. of Basic slag to each vine gave an increased return in two years' treatment at the rate of 6,732 lbs. of grapes per morgen for the two seasons, taking 3,600 vines to the morgen. 1 oz. of Nitrate of Soda and 4 oz. of Superphosphate gave an increased return in two years of 5,920 lbs. of grapes per morgen. 1 oz. of Nitrate of Soda, 2 oz. of Superphosphate and 4 oz. of Kraal ash gave an increase of 4,932 lbs. 1 oz. of Nitrate of Soda and 2 oz. of Superphosphate without kraal ash gave an increase of 1,440 lbs. about 3,000 lbs. less than with the kraal ash which contained 12 per cent. potash. A number of plots were tried at each place mentioned, and the combination of 1 oz. of Nitrate of Soda with about 4 oz. of Phosphatic manures—either Superphosphate or Basic slag—gave the best results. On Mr. Havers's farm, on the plots manured with 1 oz. Nitrate of soda, 2 oz. Superphosphate and 4 oz. Kraal ash the increased returns were highest, being 5,976 lbs. for the two years. 2 oz. of Government Guano per vine on this farm gave an increase of 2,376 lbs. whereas on Mr. Louw's farm the same dressing gave an increase of only 601 lbs. These experiments as far as they go are interesting, and go to shew that phosphatic manures are beneficial with a small quantity of nitrogen. Nitrogen was tried alone on each farm but gave but poor results. Superphosphate or Basic slag was not tried alone. The experiments also point to the fact that what does best on one farm does not always do so well on another. The value of the experiments was to an extent nullified through some of the vines having the year before been manured with farmyard manure in one instance and with basic slag in another. So far as I know these

are the only data we have of experiments in the manuring of vines in this Colony. I should say that experiments of this nature would be of great value to the wine and fruit farmer, either carried out by the Government or by Associations such as ours, or by the individual, no matter by whom, so long as they were done with accuracy for a number of years and in different districts, correct record kept of condition, nature and composition of soils, exact amount and kinds of manures used, how and when applied, returns accurately weighed or measured, and the whole of the operations and results tabulated from year to year and the information distributed broadcast among those interested in the industries. Thus in a few years' time we should have a fund of accurate local data to hand and something reliable to work on, without depending on other countries for information which, however useful it may be, is obtained under conditions of climate and soil, at any rate not quite identical with our own.

APPLICATION OF MANURES.

The manner of applying manure to trees and vines depends a good deal on the condition and class of the manure you are putting on. Farmyard manure may be well made and thoroughly rotted, or it may still contain a lot of half-decayed bush, vine cuttings, vlei grass etc. This manure is generally put on in three different ways: 1st, in holes between or at the side of your vines, 2nd, in trenches dug in every or in alternate rows, 3rd, ploughed in fairly deep in every or in alternate rows. Of these systems the hole one is the most objectionable on account of the manure being confined to one spot and only coming into contact with one portion of the root system of the vine, the young rootlets when they find their way to such a mass of manure when it is fresh and strong may be seriously injured by it. I would prefer the trench system to the hole and the ploughing in with three or four furrows to either. The more the manure is spread over and worked into the ground the better chance the roots have of getting the full benefit of the application. Stable or farmyard manure should be applied if possible in the Autumn or early Winter so as to get the whole of the season's rains. One of the great advantages of farmyard manure over artificial is the amount of organic matter it adds to the soil and the extent to which it improves the ground physically. The material put in kraals when animals are kept for the purpose of increasing the manure supply of the farm has an influence on the quality of the product. Vine cuttings, brush, pine needles etc., each add slightly different proportions of ingredients in the make-up of the manure. In the matter of pine needles, etc., heavy dressings of manure say 20 tons to the acre, when they are largely used in the kraals, may have a bad effect on plant growth through it being attacked by the acids

and resins the pine contains, but when used in moderation no ill effects need be feared. Where vines are absolutely free from disease a good deal of the plant food might be returned to the soil by the prunings being ground up and ploughed in. The fresh burned ash of the cuttings forms a valuable manure—it contains 37 lbs. Phosphoric acid, 75 lbs. of potash, 226 lbs. of lime to the ton. The exact value of Kraal manure as obtained from our drier districts is hardly yet known, but it is undoubtedly very rich in plant foods, and, supplemented with some of our artificial manures to make up the proportion of those constituents in which it is lacking, will, I think, make one of our most valuable fertilisers for trees and vines. Mr. Blackshaw, Agricultural Chemist at Elsenburg, has made an analysis of kraal manure as landed here in trucks—with his permission I have appended the result of his analysis to this paper.

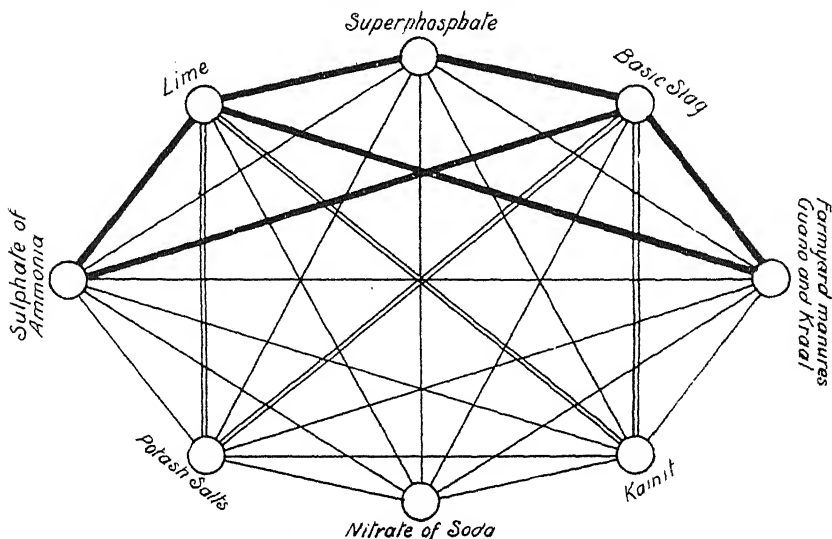
The matter of applying artificial manures is far simpler, as most of them are in a finely-divided state, and can be sown broadcast in the vineyard and in the orchard if the trees are big and the roots occupy practically the whole of the ground. It may be worked in by either plough, cultivator, or harrow. If the trees are young and small, the manure should be confined in circles round the tree, say from six to eight feet according to the size of the tree. As a rule slowly soluble manures such as bone meal, bone dust, ground bones, basic slag, etc., should be applied to the soil some time before they are actually required for the plant's use, about the same time as you would apply farmyard manure. They thus have a chance of being acted upon by the acids contained in the water present in the soil, and are rendered available for the plants' use slowly. Soluble manures such as superphosphate, sulphate of ammonia, nitrate of soda, sulphate of potash, and the like, should be applied later, when the tree begins to shew signs of vegetation, but not later than the flowering time, for the wood growth then would be liable to be forced on at the expense of the fruit crop. It is a good plan to put it on in two or three doses at short intervals—harrowing it in is quite sufficient if the soil is in good tilth.

It is better to manure consistently and in moderation every year than to give a heavy dressing one year and then to miss a year or two before giving another. It is also almost worse to give highly stimulating manures alone than to give none at all. They should be combined with slower acting ones, so that the tree or vine when forced into excessive growth will have something to fall back and feed on.

MIXING FERTILIZERS.

A few words might be said about this, as sometimes manures of different sorts are mixed to the detriment of either one or more in the mixture. A practical manner of illustrating which fertilisers

should and which should not be mixed together is prepared by Dr. Geckens, of Germany, and given below :—



[As we go to press, Mr. Tribolet writes to say, that in the above diagram superphosphates and nitrate of soda should be connected by a double line.]

Substances connected by the thick line must not be mixed. Substances connected by double lines must only be mixed immediately before use. Substances connected by single thin line may be mixed at any time. Thus sulphate of ammonia should never be mixed with lime or any manure containing lime such as basic slag or wood ashes. Lime drives off the ammonia, and thereby lowers the quality of the fertiliser. Superphosphates should not have lime in any form added to them, nor should superphosphate and Thomas phosphate (basic slag) be mixed, on account of the lime present in the latter. Bone dust and superphosphate may be mixed without danger.

Lime should always be sown in the early winter and harrowed in rather than ploughed in.

Never sow either Lime or Phosphatic manures within at least a month of sowing.

As I have already pointed out when soils vary so much as they do here, both in composition and physical texture, to slavishly follow manurial formulæ would in a great many cases be putting valuable ingredients into soil where from the point of view of getting a return they would be absolutely thrown away.

It is no use applying nitrogenous manures when your orchards and vineyards are making abundance of foliage and new wood, or a heavy dressing of Phosphoric Acid or Potash if your plants have as much of these materials as they can use. Analysis and experiment

assist us in finding out what is required. It has been practically established that Potash is one of the most beneficial ingredients that can be applied to fruit trees. Phosphoric Acid and Nitrogen not being quite so important. Again a great deal depends on what is already in your soil. Although manuring is a very important matter it must not come before tillage. Undrained, sour, badly cultivated soil is very little benefited by any manures you may put on.

Although some of you may be acquainted with the composition of the most commonly used manures, a few formulæ and a list giving the percentages of the ingredients they contain may not be out of place.

Basic Slag (Thomas Phosphate) Contains :

	17 per cent., Phosphoric Acid or 340 lbs. per ton.	
Superphosphates :	17 per cent., Phosphoric Acid or 340	„ „
Nitrate of Soda :	16 per cent., Nitrogen	320 „ „
Sulphate of Potash :	50 per cent., Potash	1,000 „ „
Bone Dust :	{ 3·5 per cent., Nitrogen	70 „ „
	{ 25 per cent., Phosphoric Acid	500 „ „
Dissolved Bone :	{ 3 per cent., Nitrogen	60 „ „
	{ 16 per cent., Phosphoric Acid	320 „ „

Government Guano (Average of 50 Samples)

11·25 per cent., Nitrogen	or	225 lbs. per ton
12·94 per cent., Phosphoric Acid	258	„ „
4·03 per cent., Potash	80	„ „
12·5 per cent., Lime	250	„ „

Government Guano (Analysed at Elsenburg).

13·3 per cent., Nitrogen	or	266 lbs. per ton.
8·4 per cent., Phosphoric Acid	168	„ „
2·76 per cent., Potash	55	„ „

Fresh Horse Manure (Department).

·59 Nitrogen	...	12 lbs. per ton.
·36 Phosphoric Acid	...	7 „ „
·49 Potash	...	10 „ „
·36 Lime	...	7 „ „

Mixed Stable Manure.

·50 Nitrogen	...	10 lbs. per ton.
·26 Phosphoric Acid	...	6 „ „
·63 Potash	...	13 „ „
·70 Lime	...	14 „ „

Mixed Farmyard (Elsenburg exposed during Summer, Samples taken in June, 1906.)

·71 Nitrogen	...	14 lbs. per ton.
·65 Phosphoric Acid	...	13 „ „
·84 Potash	...	17 „ „

Sheep Manure.

1·54 per cent., Nitrogen	...	31 lbs. per ton.
·89 per cent., Phosphoric Acid	18	„ „
2·20 per cent., Potash	...	44 „ „
7·59 per cent., Lime	...	150 „ „

Cattle Manure.

·48 Nitrogen	...	10 lbs. per ton.
·14 Phosphoric Acid	...	3 „ „
·64 Potash	...	13 „ „
·48 Lime	...	10 „ „

Kraal Manure (Uitkijk Beaufort West.)

·98 Nitrogen	...	20 lbs. per ton.
·87 Phosphoric Acid	...	17 „ „
2·62 Potash	...	52 „ „

Kraal Ash (Departments.)

12·3 Potash	...	246 lbs. per ton.
1·8 Phosphoric Acid	...	37 „ „

Ash of Vine Prunings,

11·34 Lime	...	227 lbs. per ton.
1·85 Phosphoric Acid	...	37 „ „
3·76 Potash	...	75 „ „

Samples of guano, sheep, horse, and kraal manures vary a good deal in their composition.

A good, general manuring on fair soil for stone fruits would be :

250 lbs. Government Guano.
300 „ Basic Slag.
150 „ Sulphate of Potash.

700

Taking 100 trees to the acre it should be applied at the rate of 7 lbs. to the full-grown tree.

This would give you about 30 lbs. Nitrogen, 60 lbs. Phosphoric Acid and 75 lbs. Potash to the acre.

Practically the same amounts would be supplied by giving your trees.

3,000 lbs. Kraal Manure.
350 „ Basic Slag.

3,350

or
 550 lbs. Kraal Ash.
 250 „ Government Guano.
 100 „ Basic Slag.

900

For Apples and Pears.

120 lbs. Government Guano.
 500 „ Basic Slag.
 180 „ Sulphate Potash.

800

This gives you about 14 lbs. Nitrogen, 93 lbs. Phosphoric Acid, and 93 lbs. Potash to the acre, 6 to 8 lbs. to be given to each tree according to size.

or
 1,000 lbs. Kraal Manure.
 650 „ „ Ash.
 450 „ Basic Slag or Superphosphate.

2,100

For Citrus Trees.

100 lbs. Government Guano.
 500 „ Basic Slag.
 220 „ Sulphate Potash.

820

Gives about 12 lbs. Nitrogen, 96 lbs. Phosphoric Acid and 110 Potash. Give from 4 to 8 lbs. to each tree.

For Vines.

100 lbs. Government Guano.
 300 „ Basic Slag.
 120 „ Sulphate Potash.
 30 „ Nitrate Soda.

550 lbs. per 1,000 sticks.

Gives about 18 lbs. Nitrogen, 60 lbs. Phosphoric Acid, and 62 lbs. Potash. If soil lacks lime sow up to 500 lbs. per 1,000 sticks.

Other formulae may be made giving about the same proportions of plant-food or varied to suit local conditions. Should Nitrogen not be sufficient, dressings of Sulphate of Ammonia or Nitrate of Soda may be given at the rate of about 1 to 1½ lbs. per tree, and 20 to 30 lbs. per 1000 for vines.

NOTES ON THE PACKING OF BUTTER FOR TRANSPORT.

BY R. SILVA JONES, Dairy Expert.

The systems of packing butter for market are very varied, some having their own particular virtues, but many are not conducive to the keeping qualities of the article packed, and now that the summer season will soon be upon us, these few hints may be of considerable value to farmers who have to send their butter some considerable distance.

The make-up and appearance of the butter should be neat and tastefully attractive, 1 lb. brick shaped pats being the most easily marketable, and it must be remembered that the appearance will help very considerably towards the satisfactory sale on the market. The ends and edges of the pats should be made as square as possible so that the pats of butter will fit tightly into the box, holding it as one block.

Each pound of butter should be wrapped in special parchment paper, with ends carefully and neatly folded down. This paper folds more easily and neatly down, and also has not the tendency to adhere to butter when opened out, if it is wetted prior to the folding. The paper, however, should be allowed to dry off before being finally packed. It is also highly desirable that farmers should have their names, with the name of their farm, plainly and neatly printed on the parchment paper, so that customers can the more easily see whose butter they are buying. By this means customers once satisfied will always look for the same name in future, and the farmer will reap the benefit in the shape of increased call for his butter. I have invariably noticed that on all markets, both town and country, butter so wrapped with the name on the paper claims the best price on that market. Complaint is sometimes made against the paper that it causes black spots in the butter: inferior paper will do this, but only the best paper should be bought from a firm which lays itself open to supply dairy utensils of the best quality. Another complaint is heard that the salt worked into the butter crystallises when this paper is used. This complaint has nothing whatever to do with the paper. The cause is obvious, either that the water has not been thoroughly worked

out of the butter, and after it is allowed to stand, the moisture evaporates and leaves the salt crystallised on the outside of the paper, which very considerably reduces the appearance; or that more salt has been added than the water can dissolve, which leads to a deposition of salt and detracts from its appearance.

The package or box into which the butter is packed is of great importance. An ideal box for the purpose should be light, strong, dust-proof and well made. None of the boxes used by the farmers are what you might term really ideal, but one has to choose from the best available. Many descriptions of patent butter boxes are upon the market, nearly all excellent, but their initial cost is heavy and their weight is almost prohibitive in proportion to the amount of butter they hold as it increases the cost of transport to market and in the case of non-return the loss is heavy. The most serviceable boxes are made of spruce, ash or oak which should be thoroughly well steamed and filled with hot water for at least twenty four hours; if this does not take the smell from the wood, fill a second time with hot water in which salt has been dissolved. 12½ inch. cube, inside measurement, will comfortably hold 50, 1-lb. pats. Wood ½ inch. in thickness should be ample for strength and not too heavy for transport. The common use of old soap boxes, improperly cleaned tins and such like makeshifts should be discontinued as being most detrimental to the butter.

The packing of the butter into the package is of considerable importance; whatever style of package is used, it must be thoroughly well cleaned and well dried before use. It should be lined with clean white parchment paper, which can be purchased for the purpose in large sheets. Old newspapers which are very often used, should be condemned, the paper itself is not nice and the ink often comes off on to the butter, reducing the tasty appearance at once. The butter pats should fit tightly into the box, so as not to move about and thus lose their shape if the box is not full; the packing should then be neatly folded over, and, if the box is not full, a batten nailed in to hold it just in position, if the box is full this of course is unnecessary. However there should be no movement whatever inside the box when either full, or half full. The lid can now be fastened on, and no wet cloths of any description must be inside the box, as such are likely to induce mould, should the box not be opened for a few days, besides having the tendency to give the butter a musty flavour. All that remains now to do is to protect the butter from the heat of the sun, and the best plan for this is to sew the whole box into an ordinary bag, well cleaned, which is soaked in water, or preferably salt water, and if the butter has very far to travel, the better way is to put into two bags, or first sew a piece of kaffir sheeting round the box and then sew it in the bag, soaking the whole as before. These should be kept wet so that the evaporation will prevent the heat from getting through to the butter.

One has only to visit the different markets of the Colony to see what a varied assortment of packages and methods of packing are used. Packing in butter-muslin is not by any means to be advocated. Many again line the boxes inside with wet kaffir sheeting. This too is bad and should not be continued. Put the sheeting outside the box and it will help you.

Some enterprising farmers during the summer months, particularly, pack each pound of butter in a properly prepared thin wood-strip box, these can easily be procured and cost $6\frac{1}{2}$ d. per dozen and I feel inclined to think that they aid the proper sale of the butter to private consumers and customers, and by their help purchasers can more readily handle the butter without damaging it, and I am quite convinced that they at the very least pay for themselves in a higher price obtained.

It is of little avail and encouragement to the producer to pack his butter in the best style possible, if when it arrives at the market the boxes are ripped open and often broken and the butter exhibited for sale in a slovenly manner, and there is undoubtedly great room for improvement in this direction, and I feel convinced that it would be to the advantage of all concerned if some more general and more uniform system were adopted in the make up and packing of butter sent to the various markets of the Colony. The Railway Department would then be better able to deal with the traffic and with a package of a more uniform and regular type, with the name and address of the owner clearly branded outside, they would be in a better position to see to the proper return of empties, the continual loss of which must reduce the profits somewhat, and I learn from many farmers that it is the question of return empties which deters many from adopting a better box, and makes them adhere to the present makeshift one that is now so much used. The cause of this question of return empties is by no means wholly at the door of the Railway Department, but the treatment they receive at the hands of the markets is by no means fair and reasonable.

EXPERIMENTAL CROPS IN CAPE COLONY:

LEGUMINOUS CROPS AND BACTERIAL FERTILISERS.

By. DR. ERIC. A. NOBBS, Agricultural Assistant.

The great and peculiar advantage of leguminous crops over all others warrants special effort being made to acclimatise and test foreign sorts with a view, if possible, of adding to the few well known members of this botanical family which are already at home here and the value of which none will dispute, peas, beans, lentils and lucerne, the king of all.

Perhaps the most obvious advantage of the crops of the pea tribe—the leguminosæ—is that from the time they are big enough for stock to eat onwards, even when they are dead and shrivelled and hard, they furnish a highly nourishing food for all sorts of stock, horses and cattle, sheep, and pigs, ostriches and poultry alike. They are suitable for grazing, for feeding green to stalled stock, for hay, for pasturage, and even for green manuring. There is therefore little difficulty in utilising the produce when grown.

The second great merit is the power of collecting nitrogen from the air, a faculty possessed by no other crops, and one the discovery of which only a few years ago marks an epoch in the science of agriculture. Simply stated, this phenomenon means that leguminous crops, with the assistance of a parasitic microbe on the roots, collect from the air in the soil, nitrogen, the most valuable and costly of plant foods and that from the residue after the crops are harvested the soil is enriched in nitrogenous matter. The more plentiful the bacteria, the more nitrogen is collected and the more luxuriant the crop. As a rule our peas, beans and lucerne show numerous little nodules on the roots, the outgrowths caused by and inhabited by the beneficent bacteria. These organisms can now be artificially propagated and the seed or soil infected therewith. This is desirable in any case but particularly where such crops have not previously been grown, as under these circumstances it is not likely that the soil is well supplied with the organisms.

At the same time it must be remembered that bacteria alone will not make a good crop, the soil must be rich in mineral plant foods and be properly tilled. Heavy leguminous crops

while enriching the soil in nitrogen, will necessarily, and like any other crop, take out of it phosphates, potash, lime and other necessary mineral matter.

A third point in favour of leguminous crops is that where they thrive they offer an alternative crop to grow and thus mitigate the harm done by continuous and too frequent cultivation of the same crop.

Being rich in nitrogenous matter such crops serve as a valuable food either in place of or in addition to our ordinary fodder plants. Some are annuals, some perennial, but none can claim to be better than lucerne in soils adapted to that crop, though many serve a different purpose or thrive under different conditions and hence will find with us as elsewhere their uses and their congenial localities.

It is to be regretted that in certain instances so few reports have been received, and this opportunity is taken of asking farmers to send in their reports whether favourable or otherwise in order that, from the number of opinions expressed, some decision can be arrived at as to the likelihood or otherwise of any particular crop being suitable to our needs.

In several instances there is need of further experiment and for this purpose seed will be gladly supplied to all applicants.

VETCHES.

Amongst leguminous crops to be recommended for the production of an abundance of succulent and nutritious food, next only to lucerne, vetches are coming into prominence. As the accompanying reports shew, unless sown at an untimely season or subjected to very unfavourable conditions, vetches grow quickly and give green forage at a season when it is much needed. Vetches are best fed to stock in the manger but may also be grazed down, or ploughed under as a green manure.

In the Western Province sowings in April and May seem to have failed, while September and October are indicated as the best months for putting vetches in.

Abroad it is usual to sow a cereal crop along with the vetches to serve as a support to the dense masses of twining stems and tendrils. This practise is certainly to be recommended. The double crop is cut green just as the vetches come into flower.

Apparently spring vetches will do better than winter vetches. The success so far gained fully warrants further experiment and further supplies of seed for free distribution have been ordered for the season—and will shortly arrive.

Spring Vetches.

Malmesbury (Mr. M. Melck). Sown early in August, 1905. Result: Good. Sown on sandy soil grew very well, will make excellent green manure.

Malmesbury (Mr. J. Schickerling). Sown October, 1905. Result: Good. This crop is suitable and will pay if sown a few weeks later.

Malmesbury (Mr. H. J. Van Nickerk). Sown 19th September. Result: Fair. Grew to about 2½ feet high, then destroyed by hail.

Piquetberg (Mr. E. Conz). Sown May, 1905. Result: Bad. Seed came up badly and I don't consider crop suitable for district.

Clanwilliam (Mr. W. McGregor). Sown 5th April, 1905. Result: Bad. Grew well for about a month and then with cessation of rain withered away.

Paarl (Mr. J. A. Louw). Sown 1st July, 1905. Result: Good. Good for cows and pigs. Vetches should be sown April and May or August and September.

Stellenbosch (Mr. W. L. Steel). Sown 12th July. Result: Very good. Enormous crop 3 to 4 feet high. Excellent feed for cattle.

Stellenbosch (Principal, Elsenburg). Sown 21st July, 1905. Result: Good. Yield per acre about 12 tons, 8 in first cutting and 4 in second. Should be sown with some crop to keep it up, otherwise it trails along the ground, and whitens below.

Paarl (Mr. W. McMillan). Sown October, 1905. Started well but was killed by excessive drought.

Alexandria (Mr. J. Daverin). Sown 27th June, 1905. Result: Fair. Did fairly well, but hot weather destroyed before maturing.

Molteno (Mr. A. Francis). Sown 23rd September, 1905. Result: Good. Came up well, would make good green manure, crop cut up by hail before fully matured.

Molteno (Mr. A. Francis). Date not given. Result: Good. Growing very well.

Queenstown (Mr. G. L. Peacock). Sown 9th September, 1905. Result: Indifferent. Won't pay but may grow fairly well in parts of this district if weather is suitable as regards rain.

Winter Vetches.

East Griqualand (Mr. D. Menné). Sown 22nd September, 1905. Result: Indifferent. Scarcely suitable for district unless it is used as a green manure.

East Griqualand (Messrs. Corderoy Bros.) Sown 27th September, 1905. Result: Good. Plants came up well although sown rather thick, growth luxuriant, choked all weeds including pig weed, should make splendid ensilage if it was cut about flowering stage. Stock liked it immensely even when dried out.

East Griqualand (Messrs. Corderoy Bros.) Sown 23rd March, 1905. Result: Good. Came up well but was destroyed by neighbour's sheep. Seed mixed and sown with Algerian Oats.

East Griqualand (Mr. D. B. Menné). Sown 22nd September,

1905. Result: Indifferent. May do better if sown in Autumn along with some other crop, like oats. Grew very slowly and flat and came into flower in April when frost came.

Elliot (Mr. H. J. van Niekerk). Sown 19th September. Result: Fair. Grew well up to about $2\frac{1}{2}$ feet then destroyed by hail.

Molteno (Mr. A. Francis). Sown 27th June, came up 14th August. Result: Fair. Came up well, destroyed by hail before fully matured, should have more heat I think to force germination.

Molteno (Mr. A. Francis). Date not given. Result: Good. Growing very well.

Alexandria (Mr. J. Daverin). Sown 27th June, 1905. Strong wind destroyed young plants. I do not think it suitable.

Stellenbosch (Principal, Elsenburg). Sown 27th July, 1905. Result: Bad. Germinated badly and the few plants that grew, grew badly and crept along the ground, making it impossible to cut same.

Paarl (Mr. J. A. Louw). Sown 1st July, 1905. Result: Good. Good for cows and pigs, should not be sown later than April or May.

Bloemfontein (Dr. S. Galbraith). Sown 29th May, 1905. Result: Fair. Grazed down by poultry who were very fond of it

TURKESTAN LUCERNE.

This is merely our ordinary lucerne grown from seeds first obtained from Turkey by the Department of Agriculture of the United States, which is recommended as being more draught resistant than the common sorts. This is of course a quality which cannot be determined at once but the tenour of the reports received certainly is that way, hence the seed well deserves close watching and further trial.

Several of the most encouraging reports are from parts of the country not naturally adapted for lucerne such as Stellenbosch and Knysna and if by this means the limits of profitable lucerne growing are to be widened, then Turkestan seed will indeed be a valuable find for us.

Beaufort West (Mr. Paul Nel). Sown Autumn 1905, Spring 1904. Result: Good. Grows quicker, stands frost better and is more drought resistant than old lucerne. Intend sowing 300 lbs of seed on vlei land. Not under irrigation before April 1906.

Mafeking (Mr. J. J. du Toit). Sown 19th July. Result: Good. Suitable for district and should be good for cattle.

Wodehouse (Mr. W. Wright). Sown 4th March. Result: Indifferent. More tender than the ordinary lucerne.

Molteno (Mr. A. Francis). Date not given. Result: Good. It grows stronger and is probably sweeter or more nutritious than old lucerne, as locusts destroy it before touching other lucerne.

Glen Grey (Mr. R. B. Bradfield). Sown April, 1905. Result Good. Cannot discern any difference between it and ordinary lucerne.

Victoria West (Mr. L. Ross). Sown August 23rd, 1905. Result Good. Is suitable to district but requires a good supply of water to start with.

Stellenbosch (Mr. W. L. Steel). Sown 15th May. Result : Good. Very heavy yield. A very good crop and will pay splendidly.

Stellenbosch (Principal, Elsenburg). Sown 14th July, 1905. Result : Good. Did not start as well as old lucerne, but did just as well later on.

Malmesbury (Mr. Fred Duckitt). Sown 15th August. Result : Good. It is both suitable and will pay very well in this district.

Knysna (Mr. C. W. Thesen). Sown 5th May, 12th July. Result : Good. Seed sown in drills in May, doing much better than seed broadcast in July. Growing better than the old lucerne alongside.

Bedford (Mr. F. Wienand). Sown 11th April. Result : Doubtful. Cannot as yet say whether it will pay or is suitable to district.

Uitenhage (Mr. M. G. Brown). Sown May, 1905. Result : Good. Suitable; unfortunately mine was covered with silt by big flood just after first mowing.

Alexandria (Mr. J. Daverin). Sown 20th July, 1905. Result : Good. Will do very well if rain is regular.

Oudtshoorn (Mr. W. Deas). Sown April, 1905. Destroyed by moths on appearance.

East Griqualand (Mr. L. Conolly). Sown February. Destroyed owing to drought.

East Griqualand (Mr. D. B. Menné). Sown 21st September, 17th November, 1905. Result : Good. Crops did splendidly until attacked by small caterpillar towards end December on coming into flower.

COMMON SAINFOIN.

The reports of sainfoin are somewhat conflicting and a chapter of accidents forms part of the report. There seems to be justification, however, for further experiment, and the seed will continue to be stocked for distribution.

The following are the reports :—

Stellenbosch (Mr. O. M. Barry). Sown 8th September. Result : Good. A paying crop when lucerne cannot be grown, it grows vigorously.

Uitenhage (Mr. W. Pyott). Sown 16th May. Result : Good. Crop is suitable and will pay in this part as green forage, 10 lbs. of seed gave 750 lbs. green fodder.

Komgha (Mr. M. Biggs). Date not given. Washed away by flood.

Bathurst (Mr. R. W. Elliott). Sown 21st August. Destroyed by heavy rains.

Knysna (Mr. C. W. Thesen). Sown 20th May, 1905. Result: Indifferent. Result so far poor. 3rd July, 1906.

East Griqualand (Mr. D. B. Menné). Sown 22nd September, 1905. Seed failed to germinate.

Malmesbury (Mr. M. Melck). Date not given. Seed did not germinate, though I tried at three places at different times.

Oudtshoorn (Mr. W. Deas). Sown April, 1905. Eaten completely by small grey or blue moth on appearance.

GIANT SAINFOIN

is merely another form of the same plant. On this encouraging reports have been received, though here again there is considerable disagreement and a wider consensus of opinion is earnestly desired.

Paarl (Mr. J. A. Louw). Sown 24th June. Result: Good. Good for all stock, should be sown in April or May, otherwise fails; sainfoin requires irrigation.

Stellenbosch (Mr. O. M. Barry). Sown 8th September. Result: Good. A paying crop where lucerne cannot be grown, it grows more vigorously than lucerne, and is even better than the Common Sainfoin.

Stellenbosch (Principal, Elsenburg). Sown 14th July. Result: Indifferent. Seed germinated badly, but plants that came up did well, firmly establishing themselves.

Stellenbosch (Mr. W. L. Steel). Sown May, July, September. Absolute failure, though tried repeatedly.

Malmesbury (Mr. M. Melck). Date not given. Seed failed to germinate, though tried at three places at different times.

Knysna (Mr. C. W. Thesen). Sown 20th May, 1906. Result: Indifferent. Result up to date poor, 3rd August, 1906.

Sundays River (Mr. W. Pyott). Sown 6th May. Result: Good. 10 lbs. seed sown, crop 1,000 lbs. green, suitable for dairy feeding, would do well under irrigation, vigorous growth.

Tarkastad (Mr. H. Thackeray). Sown September and March. Result: Good. Seed sown September killed by drought. Seed sown in March doing very well.

Oudtshoorn (Mr. W. Deas). Sown April, 1905. Result: Bad. Was eaten completely by a small grey moth when just through the ground.

East Griqualand (Mr. D. B. Menné). Sown 22nd September, 1905. Seed failed to germinate.

LUPINS.

Reports on this crop have been somewhat difficult to obtain. Its use being practically limited to that of a green manure on sandy land to be ploughed in before ripening, it does not appeal to many farmers: yet there can be no question as to its suitability for it is often found growing wild, and is sometimes grown as a garden flower also.

While, therefore, its value is limited, yet, on account of its free growth and hardiness, it is certainly worth more serious attention than it has yet received. This is one of the nitrogen collectors and enriches directly the ground on which it grows.

Blue Lupins.

East Griqualand (Mr. D. B. Menné). Sown 22nd September, November 30th, 1905. Result: Good. This plant, although smaller than the white, would be more suitable for these parts.

Stellenbosch (Principal, Elsenburg). Sown 18th July, 1905. Result: Fair. Does well on light soils, but did not grow well here owing to insects, cold and wet, etc.

Malmesbury (Mr. J. A. Schickerling). Sown early in October. Result: Bad. Germinated well and then mostly died off a few weeks later.

White Lupins.

Stellenbosch (Principal, Elsenburg). Sown 18th July, 1905. Result: Fair. Did not do as well as Blue, also owing to insects, cold and wet, etc.

Piquetberg (Mr. E. Conz). Sown 6th July. Result: Good. Good for green manure, should be sown early on fallow land.

Malmesbury (Mr. J. A. Schickerling). Sown early in October. Result: Bad. Germinated well, and then mostly died off a few weeks later.

East Griqualand (Mr. D. B. Menné). Sown 22nd September, 30th November, 1905. Result: Fair. Crop grew well, but did not ripen as on appearance of first severe frost in April pods were still green.

Yellow Lupins.

Piquetberg (Mr. E. Conz). Sown 6th July. Result: Good. Good for green manure, should be sown early on fallow land.

Stellenbosch (Principal, Elsenburg). Sown 18th July, 1905. Result: Fair. Did not do as well as blue also owing to insects, cold and wet, etc.

COW PEAS.

Of cow peas a number of sorts were tried. Our own "swartbek bontje" sometimes called "catjang bean" is a form of the same thing, but the American varieties have been specialised for a particular use—to produce abundance of green stuff.

The reason for trying a number of sorts was to diminish the likelihood of failure owing to the selection of the wrong variety for, obviously, the existence of many forms implies the greater suitability of one or another to particular conditions. This anticipation is borne out in the reports so far received, although the few replies do not enable a final opinion to be formed.

Cape (Mr. F. Rahmer). "*Blackeye*." Sown 19th November. No result. "*Gourd*." Sown 22nd November. Result: Indifferent. A few plants came up but did not make much growth. "*Coffee*." Sown 23rd November. Result: Fair. Did fairly well, seemed to grow better when sown thicker.

Cape (Mr. J. Smyth). "*Blackeye*." Sown 22nd December. Result: Good. Grew well and were very prolific, bearing for about a month.

Cathcart (Mr. W. F. Bennet). "*Blackeye*." Result: Indifferent. Not suitable and I do not think it will pay in this part.

Cape (Mr. T. Fox). "*Gourd*." Sown 20th September. Result: Bad. Unsuitable and I do not think will pay in this part.

Stellenbosch (Principal, Elsenburg). "*Clay*." Sown 27th October, 1905. Result: Good. Gave a good second cutting. Gave more greenstuff but less pods than "*Whip-poor-will*." "*Whip-poor-will*." Sown 27th October. Result: Good. Both suitable and will pay in this part, ripened three weeks before "*Clay*" cowpeas.

East Griqualand (Mr. D. B. Menné). "*Clay*." Sown September, December. First lot killed by frost, second lot by frost and hail.

Knysna (Mr. G. Van Huysteen). "*Clay*." Date not given. Germinated well, but destroyed by insects.

Piquetberg (Mr. G. H. Dunn). "*White*." Sown August 15th. Result: Good. Should be sown in May, gives good green forage, 1 foot high. "*Blue Hull*." Sown 15th August. Result: Good. Will do better if sown in May, is strong but stunted. "*Brouneye*." Sown 15th August, Result: Good. Should be sown in May. If cowpeas would grow 2 feet high they would make excellent hay.

East Griqualand (Mr. J. T. Moxham). "*Whip-poor-will*." Date not given. Destroyed by hail.

Matatiele (Mr. G. B. Corderoy). "*Whip-poor-will*," Sown 6th December. Badly attacked by rust, won't pay unless put in at end of rainy season.

Wellington (Mr. E. H. Read). "*Whip-poor-will*." Sown

August. Result: Bad. Unsuitable, as in summer weather is too dry and in winter too cold for seed to germinate.

Stellenbosch (Mr. J. Courtenay). "*New Era*." Sown November, 1905. Result: Fair. Gave about double the seed under very adverse circumstances.

Stellenbosch (Mr. G. N. Lindup). "*Green*." Sown 10th October, 1905. Result: Good. Grew strongly and bore well, 12 seeds in a pod, dry stalks much relished by cattle. "*Calico*." Sown 10th October, 1905. Result: Indifferent. Did not do at this time of the year.

Piquetberg (Rev. E. Poiet). "*Green*." Sown November, 1905. Result: Good. Both suitable and will pay in this part. "*Large Lady*." Sown November, 1905. Result: Bad. Will not pay from my own experience.

Cape (Mr. F. Fox). "*Calico*." Failed entirely.

Stellenbosch (Mr. W. L. Steel). "*Sugar Crowder*." Sown October, 1906. Result: Bad. Absolute failure.

Caledon (Mr. P. L. Uys). "*Sugar Crowder*." Seed destroyed by insects before sowing.

THE CLOVERS.

Frequent applications to the Department for clover seed has led to a number of trials being made, the reports of which, so far as received, are published herewith, shewing every shade of opinion. In course of time, with further trial, it may be possible to lay down more clearly than is to-day the case, the conditions necessary for these crops. It seems, however, likely that they may find a place in moist vleis mixed along with our indigenous grasses, which will give them the necessary shelter from grazing, and a chance to grow. At certain seasons they will occupy the land, and then disappear, giving place to other herbage, but reappearing in due course, as do all our "opslag" and more tender grasses. And for such purposes they will be invaluable, vastly augmenting the feeding value of pasture lands.

Giant White Clover.

Stellenbosch (Principal, Elsenburg). Sown 14th July, 1905. Result: Good. Suitable to district, and established itself well.

Malmesbury (Mr. J. V. Duckitt). Sown 10th August, 1905. Result: Bad. Entirely mastered by our native grasses.

Knysna (Mrs. A. V. Duthie). Sown September, 1905. Result: Bad. Have tried clover for many years, but it won't stand drought.

Alexandria (Mr. J. Daverin). Sown 21st July, 1905. Result: Fair. Grew fairly well at the start. but died off when dry weather set in.

Tarkastad (Mr. H. Thackery). Sown September, 1905. Just germinated, and then burned up by the sun, having no rain at the time.

Bedford (Mr. C. W. Weber). Sown 1st September, 1905. Result: Fair. Grew fairly well, but white lucerne grew much better.

East Griqualand (Mr. A. W. Sephton). Sown 18th November, 1905. Result: Fair: If not destroyed by insects, will do well, I think.

Queenstown (Mr. S. A. McConel). Date not given. Came up well, but killed by drought.

White Clover.

Alexandria (Mr. J. Daverin). Sown 21st July, 1905. Result: Fair. Grew well at the start, but died off when dry weather set in.

Colesberg (Mr. Alex. Robertson). Date not given. Result: Fair. Not hardy enough.

Strathsomers Estate. Sown 13th July, 1905. Result: Bad. Came up and grew well, then died away whilst lucerne stood all right.

Paarl (Mr. J. A. Louw). Sown 24th June, 1905. Result: Good. Good for stock, but must be sown in April or May to escape snails.

Uniondale (Mr. J. H. Kritzing, Sr.). Sown September, 1905. Destroyed by caterpillars in October.

Stutterheim (Mr. Paul Horn). Sown end of September, 1905. Cannot pass an opinion, owing to hot dry weather.

Bedford (Mr. C. W. Webber). Sown 1st September, 1905. Result: Fair. Doing fairly well, but lucerne doing much better.

Knyrna (Mrs. A. V. Duthie). Sown September, 1905. Result: Bad. Have tried clover for years, but it won't stand drought.

Malmesbury (Mr. J. V. Duckitt). Sown 10th August, 1905. Result: Indifferent. Won't pay, and is not suitable to this part.

Red Clover.

Stellenbosch (Principal, Elsenburg). Sown 14th July, 1905. Result: Good. Red grew best of clover, especially along hillside, survived the summer drought.

Alexandria (Mr. John Daverin). Sown 21st July, 1905. Result: Fair. Grew fairly well at the start, but died off when dry weather set in.

Colesberg (Mr. Alex. Robertson). Date not given. Result: Indifferent. Not hardy enough.

Uitenhage (Secretary, Strathsomers Estate). Sown early in September. Came up well and strongly, then entirely destroyed by flood.

Piquetberg (Rev. E. Poict). Sown November, December, April, and May. Result: Bad. Crop will not pay from my experience.

Alsike Clover.

Stellenbosch (Principal, Elsenburg). Sown 14th July, 1905. Result: Good. Suitable in this part, grew well.

Alexandria (Mr. John Daverin). Sown 21st July. Result: Grew well at the start, but died off when dry weather set in.

Bedford (Mr. C. W. Webber). Sown 1st September, 1905. Result: Fair. Grew fairly well, but lucerne grew much better.

East Griqualand (Mr. A. W. Sephton). Sown 12th November, 1905. Result: Bad. Will not do here.

Uitenhage (Mr. J. H. Kritzing). Sown September, 1905. Destroyed by caterpillars in October.

Crimson Clover.

Paarl (Mr. J. A. Louw). Sown 24th June, 1905. Result: Good. Good for stock but must be sown in April or May to escape snails.

Malmesbury (Mr. J. Schickerling). Sown early in October, 1905. Result: Bad. Grew well for a month then turned yellow and died off.

Stellenbosch (Mr. O. M. Barry). Date not given. Result: Bad. Does not make sufficient growth without irrigation.

Stellenbosch (Principal, Elsenburg). Sown 21st July, 1905. Result: Good. A suitable and quick-growing crop.

Caledon (Mr. P. L. Uys). Date not given. Result: Bad. This clover did not thrive.

Cape (Mr. J. Smyth). Sown 18th March. Seed failed to germinate.

Alexandria (Mr. John Daverin). Sown 21st July, 1905. Result: Fair. Grew well at the start but died off when dry weather set in.

Stutterheim (Mr. Paul Horn). Sown end of September, 1905. Result: Possibly good. I think it may do, am trying seed again.

Uitenhage (Mr. W. Pyott). Sown 16th May, 1905. Result: Good. 600 lbs. hay from 4lbs seed; should be sown August to October.

Mafeking. (Mr. H. D. Roberts). Sown 8th July, 1905. Seed did not germinate.

Egyptian Clover.

Oudtshoorn (Mr. W. Deas). Sown April, 1905. Result: Good. Exceedingly pleased with crop which is just the thing required for winter feeding, not affected by frost. If supplied with water, grows faster than any other feeding plant I know of. Allowed it to ripen, cut in February and obtained 80 lbs. seed therefrom.

East Griqualand (Mr. D. B. Menné). Sown 21st September, 1905. Result: Good. The clover from the first grew splendidly and gave a grand crop as it stood but did not seed sufficiently to warrant cutting. It did not actually dry off until the frost came and then it was not worth cutting.

Bedford (Mr. C. W. Webber). Sown 1st September, 1905. Result: Fair. Grew fairly well but weeds grew better. Lucerne doing far better.

Bedford (Mr. J. E. Pringle). Sown 1st September, 1905. Result: Fair. Does not stand drought as well as lucerne.

Adelaide (Mr. A. Barker). Sown July 1905. Result: Bad. Grows quickly but hot sun and wind destroys it even when wet.

Graaff Reinet (Mr. Elbie S. Kirkman). Date not given. Result: Indifferent. Sown alongside of lucerne and at same time, green while water lasted then died off, lucerne doing well.

Piquetberg (Rev. E. Poiet). Sown Nov., Dec., April and May. Result: Bad. Won't pay, judging by my own experience.

Alival North (Mr. C. G. Hards). Sown 24th March, 1906. Just as the seed sprouted it was eaten by some insect which also attacked some lucerne grown at the same time.

Certain crops have not given good results, or at least the reports received so far are unfavourable. Such seed will now be tried only at the experiment stations in order to ascertain wherein the cause of failure lies, before being again more widely distributed. Under this category, come Sulla, Soy bean and Velvet bean.

BACTERIAL FERTILISER.

A note on leguminous crops would hardly be complete without reference to the bacterial fertiliser alluded to above.

Experiments in this direction have purposely been somewhat restricted in view of the doubt which still surrounds these questions. Mr. Robertson of the Bacteriological Laboratory, Grahamstown, has maintained a culture of the fertilising bacteria alive from stocks procured in America and Germany from which material has been distributed to farmers.

Not all reports have yet been received, but those regarding peas and beans certainly indicate that by means of this very simple process the yield can be materially increased and as it is certain that the seed cannot be harmed, it appears plainly advisable for all farmers to use the bacterial fertiliser for such crops.

With a slower growing crop like lucerne which takes some time to establish itself and which generally is sown on rich and well-watered land, the advantage is not so immediately obvious nor so easy to measure, yet here again it would be wise whenever lucerne is sown on new land which perhaps is not naturally supplied with the organism, to infect the seed with the artificial culture.

Until this article, therefore, is regularly stocked by merchants and storekeepers and is readily obtainable, supplies will be maintained by the Agricultural Department and distributed to all applicants prepared to furnish in due course reports on the results such as those now published.

Bacterial Fertiliser on Beans.

Graaff Reinet (Mr. F. J. Haarhoff). Date not given. Result: Good. Plants from inoculated seed grew more vigorously, gave more pods, and continued bearing much longer than untreated plants.

Stellenbosch (Mr. C. N. Lindup). Sown August. Result: Good. Beans treated did a third better than untreated seed.

Cape (Mr. W. N. Brown). Sown July. Result: Good. Crop treated with bacteria considerably better than untreated crop.

Caledon (Mr. J. S. Le Sueur). Sown 15th October. Result: Good. Crop from treated plot 10 lbs., from untreated plot $4\frac{1}{2}$ lbs., from manured plot 10 lbs., so bacteria took the place of manure.

Port Elizabeth (Mr. N. Nance). Sown 25th July. Practically a failure owing to heavy rains or floods.

Knysna. (Mr. H. G. Fourcade). Sown February, 1906. Result: Indifferent. Local seed alone could be secured in sufficient quantity for trial, which seed is badly infested with anthracnose. Inoculation did not appear to be successful. Much better results were obtained from clean imported seed.

Bacterial Fertiliser on Peas.

Kokstad (Mr. E. A. Woodrooffe). Sown October 22nd, 1905. Result: Fair. Nodules plainly visible on plants from inoculated seed, not any on those not inoculated, pods and seeds were finer on plants from inoculated seed.

Piquetberg (Mr. G. H. Dunn). Sown 12th August, 1905. Result: Fair. Better crop from inoculated seed than from ordinary seed.

Stellenbosch (Mr. G. N. Lindup). Sown 14th July. Result: Good. Treated seed 25 per cent. in advance of untreated seed.

Cape (Mr. W. N. Brown). Sown end of July: Result: Indifferent. Seed treated with bacteria only did slightly better than untreated crop.

Caledon. (Mr. J. S. Le Sueur). Sown 17th July. Result: Good. The increase in crop quite justifies the use of bacteria.

Albany (Mr. W. E. Masters). Sown September, 1905. The crop was the same in every respect as from seed uninoculated.

Port Elizabeth (Mr. R. Nance). Sown 25th July. Pretty well drowned out on the 11th October.

Bacterial Fertiliser on Lupins.

Tembuland (Mr. M. H. Wilhelm). Sown January. Result: Seed did not seem bettered by treatment.

AGRICULTURAL SHOW DATES.

The Secretary of the Agricultural Union (Cape Colony) has received the following list of dates for Agricultural Shows in 1907. Agricultural Societies have been circularised to fix their dates thus early in order to give an opportunity of re-arrangement in case of threatened overlapping. Those Societies that have not as yet selected a date, should do so as early as possible, and communicate same to the Secretary, Agricultural Union, Box 3, Cape Town, or to the Editor, *Agricultural Journal*.

Paarl, on Thursday, January 24.

Stellenbosch on Thursday, January 31.

Aliwal North, on Tuesday and Wednesday, February 12 and 13.

Bayville, on Friday, February 15.

Western Province, at Rosebank on Tuesday, Wednesday, and Thursday, February 19, 20, and 21.

East London, on Thursday, Friday, and Saturday, March 7, 8, and 9.

Barkley East, on Wednesday, Thursday, and Friday, March 13 and 14.

Caledon, on Thursday, March 14.

Oudtshoorn, on Wednesday, Thursday, and Friday, March 20, 21, and 22.

Midland Agricultural Society (Graaff-Reinet), Tuesday and Wednesday, March 26 and 27.

Bathurst, sometime in March, no date fixed yet.

Cradock, on Tuesday and Wednesday, April 2 and 3.

Albany Agricultural Society, at Grahamstown, on Thursday and Friday, April 4 and 5.

Port Elizabeth, on Wednesday, Thursday, and Friday, April 10, 11, and 12.

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith. A *nom de plume* may be attached for publication.

Lambs Dying.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—During the last two or three weeks I have lost a number of lambs from one to two months old; on opening them I found a lot of straw-coloured water internally, more so about the heart. This water did not congeal, as is the case in heart water, and I am at a loss what to treat these lambs for. The symptoms of the disease are—the lamb becomes very dull and weak followed by acute diarrhoea, and dies within 24 to 30 hours. I would be glad of any advice you can give me on the above subject, through the next issue of your AGRICULTURAL JOURNAL.—Yours &c.

FARMER.

Peddie, 5th August, 1906.

From "Farmer's" description of the disease amongst his lambs, which is rather vague, I am of opinion that internal parasites are the cause of the trouble; the worm will be found most probably in the intestines. The disease may be complicated with heartwater, but I hardly think so from his description of the fluid in the chest.—J. D. Borthwick, Acting Chief Vet. Surgeon.

[We may add that our Correspondent will find full particulars as to the treatment for worms in No. 5, of Vol. XXVII. *Agricultural Journal* (Nov. 1905), and had he enclosed his name and full postal address a pamphlet containing that article would have been forwarded to him by post. If correspondents will adhere to this rule we can answer them promptly, if not they have to wait until the next issue of the *Agricultural Journal*.—EDITOR A.J.]

Lamziekte and Stijfziekte.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I would with your permission like to make a few remarks anent the above diseases, about which there seems to be a difference of opinion. To my mind the two are not in any way identical, or attributable to the same cause.

I believe the meaning of the word "Lam," is paralytic or paralysed, and hence the name as applied to the real Lamziekte (Meningitis), the disease which is the subject of Mr. Gunning's letter in the July number of the *Agricultural Journal*, and which Mr. Hutcheon terms the "So-called Lamziekte" which die within 38 to 40 hours.

About 25 years ago Lamziekte made its appearance amongst my cows, notwithstanding that I had fed crushed bones to them regularly for Stijfziekte from 4 or 5

years previously; and, as with Mr. Gunning, it appeared to carry off the fattest, healthiest and best conditioned animals in my herd. After that I had an occasional case at long intervals. Then, two years ago it again broke out, carrying off one cow and most of my oxen. Losing my oxen with this fell disease, proves that it does not confine itself to cows, and young stock alone. I attributed this last outbreak to my veld having been all burnt out the year before, but of course I may have been mistaken and the burning may have had nothing to do with it.

The trial experiments suggested by Mr. Hutcheon, to prove the preventive effects of Bone-meal for Lamziekte, would not be a sufficient proof, even if the disease did not appear during the experiment. Judging from my own experience I am of opinion that bone-meal or crushed bones is absolutely useless as a preventive for Lamziekte (paralytic sickness).

Stijfziekte, is very different from Lamziekte, and is mostly noticed in young stock, and cows shortly after calving. This disease is undoubtedly attributable to the deficiency of phosphates in the pasture. When cows get this painful disease they fall off in condition rapidly and are very soon reduced to mere skin and bones if they are not at once attended to. They move about with difficulty and have the appearance of being stiff in every joint, and hence the name.

Soon after I came here, over thirty years ago, my cows fell off in condition and some of them were soon reduced to a pitiable state. The disease was locally called Stijfziekte. Noticing what a craving they had for bones, I bought up from the Natives, all the bones I could get which I broke up and gave to the cows occasionally.

I have fed crushed bones or bone-meal to my cattle for the past thirty years, and can unhesitatingly say that crushed bones or bone-meal is a positive preventive and cure for Stijfziekte (Stiff Sickness).—Yours &c.

JAS. GLASS.

Goldspring, July 21, 1906.

With respect to the question raised by Mr. Glass regarding the difference between Lamziekte and Stijfziekte, I do not know that I can explain the matter much clearer than I did in my reply to Mr. Gunning's letter on the same subject which appeared in a previous number of the *Agricultural Journal*. The Veterinary Department has long recognised that more than one disease is prevalent amongst cattle in Griqualand West, but no differentiation is made by the farmers, for example Mr. Gunning mentioned the fact that unless the intestines, and their contents, of those that die are carefully buried or burned, other animals will contract the disease if they happen to get at them. This undoubtedly points to a contagious or inoculable disease, most probably Anthrax which has been allowed to spread for years in Griqualand West both amongst horses and cattle, by the neglect of many farmers to carefully bury the carcasses of those that die. Further, as I mentioned in the same communication, Mr. Bowhill, until lately Director of the Veterinary Laboratory at Grahamstown has discovered that many of those acute cases in the Coastal Districts which die within from 36 to 48 hours, are chiefly if not wholly, due to a special class of micro-organisms called Pasteurella, vide *Agricultural Journal*, April 1906. It is quite possible therefore and very probable that similar cases are prevalent in Griqualand West. I am of opinion, however, that the main causes of loss are due to Anthrax and Lamziekte. At any rate as soon as I am fit to undertake the work, I want to bring up one of my assistants who has had some experience of the disease down along the Coast districts, and we will try to investigate the matter and devise some experiments which may assist in elucidating the subject, and help in discovering some remedy, preventive or curative. Our experiments will not be confined to bone meal alone, although where real Lamziekte and Stijfziekte may be prevalent I want that to have a proper trial.—D. HUTCHEON.

Notes by Ignoramus.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—As I have only been farming for a few years, and am looked upon as rather a greenhorn at the job, I am afraid I should come under the scathing sarcasm of the "old experienced practical farmer," if I have the presumption to offer any ideas on farm matters in your interesting and valuable journal, consequently I feel safer from the withering scorn with which my ideas might be met by those hard headed and dogmatic gentlemen if I write under the above *Nom de Plume*.

Begging your forgiveness for this preliminary canter, I will proceed to give you my idea of the cause of a great deal of our "Stock Diseases," I am only speaking generally, and do not refer to any particular disease.

Living on a sour veld farm, I have found that nearly all my cases of disease in Shor Cattle, Goats and Ostriches occur after a bout of very dry weather, when the grass is dry and burnt up by frost, and there is no green herbage. I have gradually arrived at the firm conviction that *constipation* is the elementary cause of a good deal of sickness. Constipation is attended by congestion of the bowels, followed by the liver being inflamed, then lungs and heart, the animal finally dying of general complication of all his vital organs becoming diseased and swollen.

With dogs, I have had great experience and treated scores of cases of distemper, making careful observations as the disease progresses, and many *post mortem* examinations. Those whom I carefully dieted and gave opening medicine to, and a liver pill occasionally, often escaped the disease, or had it in a milder form, and Cattle, Sheep, Goats, and Ostriches if they are for some months on dry pasture become constipated, drink more water, which is probably not pure, and the above sequence of diseases follows going under the many inscrutable names that our Vets. call them.

I am of firm opinion that if farmers could grow sufficient Lucerne, Rape, Barley &c. to give their stock, large and small, a bellyful of healthy green fodder once a week or if possible a little every day, our "Vets" or a good many of them would have to seek pastures now.

In conclusion, I am not dogmatic in this idea, am open to correction and would like to invite discussion and the opinion of the "Practical and experienced farmer," and our able Veterinary Staff.

My sheet anchor against disease generally is, a large trough in the shape of a horse manger always filled with a continuous and unlimited supply of well mixed Sult, Bone meal (sterilized) and sulphur, slightly browned with tar, at every stock station.—Yours &c.

IGNORAMUS.

Treatment of Stable Manure.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In the November, 1904, *Agricultural Journal* an interesting paper appears by Dr. William Somerville M.A., D.Sc., etc. etc., on Scientific Agriculture. It was pointed out that by storing the manure in pits the valuable portion of the manure that is the nitrogen, was conserved, only losing about 13·25 per cent. but that placed in heaps in the field it lost 82·5 per cent.

I have been experimenting on the above and will briefly tell you my plan. I dug a trench 4 feet wide and 2 feet deep—the stable was cleaned out every morning—and the litter taken to the pit. After placing a layer of manure, I sprinkled it with Guano then I placed a layer of green manure, dried leaves, burnt ashes, soot, and any refuse from the house such as tea leaves and slops, and then another layer of manure, and on the top I placed a layer of earth and trod it well down. By this means the strength of the manure is confined, poultry do not disturb the heap, and in the summer time you are not troubled with flies.

I do not know the exact strength of the manure, but I know it is very strong and a little goes a very long way.—Yours, etc.,

C. JOHNSON.

Fern Gully, Plumstead.

The method detailed by Mr. Johnson modified to suit circumstances is no doubt correct both from a scientific and a practical point of view. A few inches of soil on top of the manure heap absorb all the gases arising from the processes of decomposition and more particularly the valuable ammonia is so preserved from loss. Attempts to attain this object by strewing the heap with gypsum, Kainit or common salt have all been tried but nothing excels the simple expedient of a covering of earth.—E.A.N.

"Bars" in Ostrich Feathers.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—A few months ago you published a letter of mine in which I drew attention to the efficacy of *Leaver's Eagle Brand Tobacco Extract* as a preventive for "Bars" in feathers. You added a footnote, inviting me to prove the value of my preparation, and I now enclose a copy of a report I have received from Mr. Arthur Douglass, the well-known Ostrich farmer in the Albany district, which fully bears out the claim I put forward.—Yours, etc.,

RALPH LEAVER.

Heatherton Towers,
Grahamstown, 4th July, 1906.

Mr. RALPH LEAVER,
Grand Hotel, Grahamstown.

DEAR SIR,

"BARRED" OSTRICH FEATHERS.

Replying to your verbal inquiry this morning, I may state that I have farmed with Ostriches for many years, and I have no doubt that "Bars" in Feathers are very often caused by the Lice and Fly. From practical experience I can say that *Leaver's Eagle Brand Tobacco Extract*, used as a Spray or Dip, and mixed in the proportions of one tin to 200 gallons water, will absolutely eradicate these parasites from the birds. Further, the condition of the birds will be improved by the use of your Tobacco Extract, and I recommend farmers to try it.

Yours, faithfully,

(Signed) A. W. DOUGLASS.

We publish the above as requested, but it will be noted that Mr. Douglass merely expresses an opinion on the main question. He does not state that he has prevented "bars" in feathers by using this dip; but that it kills lice and flies, which, in his opinion, very often cause the "bars."—ED. A. J.

Cinquantino Mealies.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—re a letter written by Mr. Aug. Prister re "The So-called 'Italian Mealies'" on page 252 of *Journal* No. 2, August 1st, 1905, Vol. XXVII.

I wrote to Mr. Prister some time ago to the address he has given but, up to now, I have heard nothing from him.

I am anxious to try this mealie (Cinquantino) this coming season and wrote asking him where I could procure seed, also price and quantity. Can you perhaps give me the information?

I planted the "Yellow Dent" mealie last season but, being one that takes months to grow and ripen, I had a great loss. Owing to the drought in November and December last they did not come on well. Thinking to reap about 600 bags we only managed to reap 33, so if I can get a much quicker mealie I will be very glad.

Do you know, please, if the Cape Agricultural Department have any of this seed for sale, if so, could you please let me know what their charges are.

Trusting to have a favourable reply, and thanking you in advance.—Yours, etc.,
HARRY BUTTON.

Balfour, Transvaal.

The Cinquantino mealie is not at present procurable in this country. Along with a number of other choice varieties a supply of seed of this mealie is being obtained for free distribution in small quantities to farmers for trial and report. As we have as yet but little information on the relative merits of these varieties it would be premature to advise farmers to purchase any of these sorts in quantity or to recommend merchants to stock these. The Agricultural Department of the Cape does not sell seed, but distributes freely for experimental purposes, not, however, to farmers beyond the limits of this Colony. Our correspondent should, therefore, apply to the Agricultural Department, Pretoria.—ERIC A. NOBBS, Agricultural Assistant.

Chronic Diarrhoea in a Horse.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Can you please give me any idea or remedy? I have a horse that whenever I use him starts purging. He has been like this for the last twelve months. He starts if I only go about four miles, the discharge being very thin, pure water. I have tried him on all sorts of food, but it's all the same.—Yours &c.

F. W. EVA.

Morning Sun, Tarkastad, July 19, 1906.

A confirmed case like this points to the probability that it has become constitutional and therefore difficult to cope with. The course recommended by the Veterinary Branch in this case is to put the animal on tonics. The following is suggested. Four ozs. of Gentian, four ozs. Bi-Carbonate of Soda, and four ozs. of Common Salt. Mix together dry and give a heaped table-spoonful every night in a dry feed. Another excellent thing in such a case is to be careful to water the animal *before* feeding and *never* give water until a considerable time after feeding.

Injury to Horse's Hoof.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Can you let me know what should be done for a horse whose quick has been injured by the hoof being rasped into the flesh by defective farriery. In the mare in question, the flesh inside the rim of the hoof festered within a day of the injury and she has been unable to more than barely touch the foot to the ground for the past three weeks.—Yours &c.

J. M. GRIMY.

Tiger Kloof, Roode Hoogte, July 26, 1906.

Reply posted. In a case like this you should carefully clean out the injured feet with Jeyes' Fluid and warm water. When thoroughly clean apply a Hot Bran Poultice, the water of which should have a little Jeyes' Fluid in it, say a teaspoonful to the quart. After poulticing for two or three days, apply the following dressing on a pad of tow, and bandage up:—One drachm of Iodoform and one drachm of Calomel with one ounce of Boracic powder mixing them together and applying dry. If you cannot get Boracic powder use an equal quantity of Jeyes' Sanitary Powder.

Acute Congestion in a Mule.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I lost to-day a very valuable mule. He was found rolling in the stable this morning and appeared to be suffering from colic. An old farmer here recommended dosing with a bottle of wine. This was done without success. I saw subsequently that he was suffering from congestion of the anus as he was straining very heavily, and I tried to rake him but did not succeed in bringing away any faeces. I then dosed him with $\frac{3}{4}$ lb. of Epsom Salts and he died within an hour. Was my dose too large or the wrong one? What treatment do you recommend? The mule was greatly blown and appeared to die from this cause.—Yours, etc.,

J. BRUESLER.

Hermion, July 24th, 1906.

The mule evidently died from acute congestion. The Veterinary Branch advise in a similar case in the future you should give of Laudanum an ounce and Sweet Spirit of Nitre an ounce. If no relief is then obtained give a pint of Raw Linseed Oil. A large dose of salts is not advisable in a case like this.

Damaged Mealies for Silage.

Dosing Lambs for Tapeworm.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Could you inform me (1) whether a mealie crop, the leaves of which had been frost-bitten, would be damaged for ensilage and to what extent? The crop referred to was just at the right stage for ensilage when we had a severe frost, so we immediately cut it down, chaffed and put it into the silo before it had time to wither very much.

(2) How long lambs (one to three months old) should be fasted before dosing for tape-worm? The dose we use is Cooper's powder. I see in one of Dr. Hutcheon's many useful pamphlets that he recommends a moderate fast. Would fifteen hours be long enough? When dosing before, we have always fasted the lambs for about fifteen hours and have, I think, been fairly successful in expelling the tape-worm.—Yours, etc.,

Rooedeoogte, July 26th.

KAROO BUSH.

1. The best use that could be made of the damaged mealies mentioned is to make them into silage. Promptitude in getting them into the silo is also the correct course.

2. In dosing lambs for tape-worm, fifteen hours is considered a sufficient fast. For full-grown sheep the fast is generally longer.

Frost-Bitten Oats and Abortion.

To the Editor, AGRICULTURAL JOURNAL.

SIR, -After feeding my cows for ten days on green oats, partly frost bitten, one of them dropped a dead calf, very small, possibly 3 to 4 months old. Can the feeding have anything to do with it, or is it more likely that as she is polled and the other cows horned, the horning at the feeding-place caused abortion?—Yours &c.

Graaff Reinet, July 27, 1906.

A. H. MURRAY.

The cause of the cow aborting was very probably the frost-bitten fodder. Wilted green fodder is always to be avoided as suspicious because it is difficult to say what chemical changes take place in the constitution of the plant when subjected to these conditions. In any case green oats alone does not strike one as a perfect feed for a cow, unless mixed with a certain proportion of dry stuff. The horning of the other cows at the feeding place might have had something to do with the abortion but in that case you would probably have been able to trace some injury either to the dam externally or to the calf when dropped.

Sore Eyes in Cattle.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I should feel greatly indebted to you if you would advise me on the following :—Of late I have had several cows and calves suffering from very bad eyes and am at a loss to understand the cause of the malady. These are the symptoms :—(1) The first sign of this on-coming disease is intimated by the watering of the eye, this continuing for about 10 days. (2) A blueish film then gradually covers the whole of the affected eye and becomes thicker and thicker and ultimately it turns quite yellow and sometimes the eye becomes quite red and looks like a ball of blood. (3) The animal so affected is now quite unable to see out of the eye. (4) The eye remains bad for about two months, when the disease gradually disappears, the thick film begins to leave the eye, but a round speck remains in the centre of the eye for quite a considerable time after the animal has regained its sight. (5) Very rarely both eyes become affected, and the animal would appear to suffer pain.

I believe several other farmers in this district have had cattle suffering in a similar way, and they attribute the cause of the disease to a fly which they assert lays eggs in the animal's eye, and they have recommended blowing blue into the eye as an effective cure.

Is there no means of checking the advance of the disease in its early stages? Is it contagious by an animal so infected coming into contact with others?

Trusting you will be able to enlighten me on this matter and that I have made myself sufficiently clear.—Yours &c.

NEIL BOSS.

Pamphlet forwarded dealing with the various diseases of the eye which gives information on the subject mentioned. From the description, the cattle seem to be suffering from Ophthalmia, not worms. This our correspondent can decide for himself and treat accordingly as full details are given of both in the pamphlet "Diseases of the Eye."

A Refractory Cow.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Could you let me know whether there is such a thing as a milking apparatus and where obtainable.

I have bought a cow, which, I am afraid has been spoilt by her previous owners. Before milking her, I allow the calf to drink a little, and before I have milked out half the full supply she draws up the remainder and I cannot squeeze a drop out again unless I allow the calf to drink on one side while I milk on the other. Perhaps you might let me know how to cure her of this habit.—Yours, etc.,

A. B.

Ladismith, C.C., July 31st, 1906.

Milking machines are in common use as labour savers for large dairy herds but we know of no machine or apparatus that will compel a refractory cow to give down her milk. The only remedy, we believe, is care and kindly handling on the part of the milker, using the calf as far as possible to induce the cow to give her milk. Some cows will never give their milk without the calf. Some correspondents with practical experience may be able to offer a few hints.

Diseased Pork.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—What is the reason pigs, well and cleanly fed, and getting fat and looking perfectly well, when killed, are found, more or less, full of a small round white substance like buck shot? The coloured people eat such meat, when not too bad, and it does not affect them in any way. Is there any remedy as this disease has been very prevalent here this year.—Yours, etc.,

OBSERVER.

River Zonder End, July 19th, 1906.

The pigs mentioned are evidently affected with what is usually described as "Measles." This so-called "Measles in Pork" is nothing more nor less than the cyst or larval stage of the Tapeworm that afflicts humanity. It is transmitted through the pig when kept in insanitary surroundings or allowed to range at large where they can pick up the egg-sacks of tapeworm from the defecations of human beings. The eggs germinate in the stomach of the pig and then form the embryo which works its way into the fatty parts. When the pork is eaten by human beings the whole cycle is set up again. The remedy is to see that the pigs reared to supply pork for human consumption are kept in such conditions that they cannot act as scavengers.

Grubs in Seed Potatoes.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Would you be kind enough to let me know, through the medium of your *Journal*, whether it is advisable to plant seed potatoes infested with grub, and the best method to combat this pest, which is largely on the increase in my neighbourhood. I find it in potatoes which were dug up scarcely a week ago.—Yours, etc.,

FARMER.

Botha's Halt, District Worcester.

It is not advisable to plant seed potatoes that are not perfectly healthy, if the planter's object is to raise a crop. In a case like this it would be better if specimens were forwarded, as the particular infection might then be identified and remedies suggested. From the above description it is impossible to give reliable information.

The Cypher's Model Incubator.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I was very much interested in "Poultry for Profit" in the June issue. Could you be so kind as to tell me the following:—

Is the Cypher's Model Incubator a good one? I have one, and so far it has been very unsatisfactory. Also, about testing the eggs; it gives no instructions, and I don't understand how to do it. Is there no way of testing out unfertile eggs before incubating? It seems such a waste of eggs.

How can you tell which are dead chicks? Also, what is the cause of some of the chicks dying? In one hatch I found eighteen dead chicks, nearly full grown. I should be glad to know if it is my fault, or a bad machine.

Do you think it would do any good to put a shallow vessel of water under the egg tray, as so many of the chicks seem to get the shell stuck fast on to them after "pecking," as though the heat dried them too much?—Yours, &c.,

CHICK.

Sneezeewood, June 27.

The following notes were supplied by "Shamrock":—"Glad to know the Poultry notes interest you. I have no personal experience of the Model Incubator. In England and America it enjoys a large sale and good reputation. Let me know fuller particulars regarding machine, viz.: Where is the machine worked—in a cellar or room? On a cement or wood floor? Is there plenty of light and ventilation without drafts? Does the machine keep a regular temperature? Have you tested your thermometer? Testing is usually done on the sixth or seventh day of incubation; the tester is put over a good strong light (in a dark room preferably). When you hold up the egg in front of the light—if the egg is unfertile—it will be quite clear. If it is fertile a black spot will be noticed about the middle of the egg and veins or arteries running from the spot. Unfertile eggs may be used for feeding the chicks or for cooking purposes, with perfect safety, so there is no waste of eggs. The only way to tell dead in shell is by watching the air cell—that is, the space at the top of the egg. If this shews no signs of development the bird may be taken as dead, or the egg addled.

"Chick" later on forwarded the following details:—"The Incubator is in a "wattle and daub" room, with a mud floor. It has plenty of ventilation, and is not in a draught. Such a lot of the chicks die in the egg, almost ready to hatch. The thermometer keeps a fairly regular heat, but has never been tested, I don't know how to test it.

In "Shamrock's" last letter he speaks of a "moisture device he saw on a Cypher's machine," I should be very glad to know, what sort of a thing it is, and if I could procure one anywhere, as I am sure the machine is too dry for this climate.

I cannot understand such a large number of eggs being unfertile. Can it have anything to do with feeding? My fowls have the free run of the whole farm, I feed them regularly, chiefly on mealies, give them lots of chopped up china etc., and green food. I bought a lot of new cocks, and still, more than half the eggs are unfertile. Can you explain this or suggest any remedy?

In reply "Shamrock" supplies the following:—"Thermometer *must* keep a regular temperature else it is useless. In order to test thermometer, you will require two thermometers one of which is known to be accurate, place the two thermometers closely together in a cup of warm water, if both thermometers register the same heat they may be taken to be correct. It would be advisable for you to procure one or two thermometers.

"The moisture device mentioned in my last, is a small copper tank which fits on the heater of incubator. This device is filled with water which is drawn into the incubator by specially prepared paper, the amount of moisture can be regulated. In addition to using this device I would recommend the floor of the room in which the machine is working, to be sprinkled with water every morning and evening after the tenth day of incubation. Keep bottom ventilators closed during the whole hatch.

"The unfertility of eggs may arise from a number of causes. Want of bone-forming material in the food. Old male birds, or, too few male birds in the flock, or from using eggs from hens not fully matured. Mealies are the *worst* food you can give your birds. This probably accounts for the infertility. Use good wheat, Kafir corn, beef scraps, bonemeal and as much green bone as the birds will eat. Grit and oyster shell are both important."

Green Bone for Poultry.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In the issue of June I see an article on Poultry for Profit, in which the writer deals with ground bone and a certain machine for the crushing of bones. Could you give me any further information about the abovenamed. Must it be just raw bone, or are cooked bones just as good? Can one break any sort, or must it be just fresh bone? I am just beginning to farm with poultry, and if you can give me any information with regard to these I shall be obliged. The writer of the abovenamed article says that for the production of eggs one must have very special stock. Can you also inform me where I can get the best Minorcas, and at what price more or less?

Yours, &c.,
Z. BLONERUS.

Britstown, June 23, 1906.

"Shamrock" says:—Cooked bone may be used as well as raw butcher's bone, but the machine that grinds the one will not grind the other. What I recommend is green bone, that is, bone uncooked. The best machine for grinding green bone is Mann's Green Bone Cutter No. 7, price £3 15s., Messrs. Geo. Findlay & Co., Parliament Street, Cape Town. They have smaller machines, I believe, equally as good, but No. 7 is the one I use and find it very satisfactory. There are several breeders of Minorcas here, the foremost, I think, is Mr. Davidge-Pitts, Cape Town. His prices I do not know, but a card to him will elicit the information required.

Swiss Milk Goats on the Karoo.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In your June and August issue I note some correspondence *res* above. Mr. Alston's letter escaped my notice or I might have written before. Messrs. Battenhausen Bros. Britstown, imported some of these valuable animals some few years ago, I was offered a 5 month old ram for £5. I don't know the other prices.

Their ewes gave 6 bottles of good milk daily.

I sent 5 of my best Boer ewes to Britstown to run with their flock. In time they kidded and we had 5 ewes and 2 rams, they look just like the Swiss, only have short horns (Swiss have none). They are now 2 years old. While we fed them on lucerne and bran mash they grew very well. Then we sent them to a farm to run. This was last summer. The farmer came and told us to fetch them back or they would die. They picked up as soon as the cold set in, and are now big and fat and in kid.

I am certain that the "cross" will answer much better than the pure here on the Karoo as the latter cannot stand the heat.

They are so intelligent they come when called by name.

When they have kidded I will write and tell you how they milk.

The farmer complains that they are so wild, run from one flock to another. I will be pleased to give Mr. Alston any further information if he will write to me. —Yours &c.

F. WOLFF.

Vosburg, *via* Britstown, August 18, 1906.

RURAL REPORTS.

For the month ending 15th August, 1906.

Aberdeen.—Veld in good condition with nice weather. Average crop of cereals. Stock generally in fairly good condition.

Albert.—Veld in very bad condition, and weather very cold and changeable. Vines in fair condition mostly Cape Stocks. Cattle and horses in fairly good condition.

Aliwal North.—Very cold weather and veld not in good condition. In some parts stock is inclined to be poor whilst in other it is in fairly good condition.

Barkly East.—Veld in bad condition and weather very frosty. A good deal of wheat has been sown but some farmers are holding back until there is some rain. Cattle and pigs are in good condition but sheep are not up to the usual for August.

Barkly West.—Veld dry but plenty of feeding for stock of all kinds. Cold frosty weather and strong winds, with no sign of rain. There are a few vines here on Cape Stocks. The chief fruits are peaches and apples. Cereals doing well. Stock generally doing well except for Lung sickness which seems rather prevalent.

Bedford.—Veld in fair order but burnt up considerably by frequent heavy frosts and high cold cutting winds. Very cold weather towards the end of July after an unusually mild June. Frosts have been unusually heavy and frequent of late, a little snow was seen on some of the mountains a few days ago. Very light rainfall, below the average. Lucerne dormant during winter and owing to dry weather there is no sign of growth as yet, Stock generally doing well.

Bredasdorp.—Veld in bad condition and weather cold with light rainfall. Cereals doing well. Stock generally satisfactory.

Cape Town.—Cold weather with light rainfall. Veld looking fairly well. Fairly good crop of oats and wheat. Stock generally in fairly good condition.

Carnarvon.—Grazing scarce. Weather variable with heavy frosts. Rainfall nil. Very small crop of wheat. Stock generally in fairly good condition.

Cathcart.—Weather very cold with frost and winds. Not much fruit grown, principally peaches and apples, the former being very much diseased last year and full of maggots. A few Cape vines are grown in this district. Cereals doing fairly well. Condition of stock generally fair.

Ceres.—Weather very cold with average rainfall. Veld in good condition. Good crop of wheat and oats. Stock generally doing well.

Glanwilliam.—Veld in very good condition considering the severe East winds that have been experienced. Dry windy weather, very cold and stormy with heavy frosts. Average rainfall. Crop of cereals fair. Very little Lucerne. The chief fruits are oranges and naartjes. Stock generally in fairly good condition.

Gradock.—Veld very dry and weather cold. Very few vines are grown in this district. Fruit promising. Good crop of cereals expected. Stock generally doing well.

Fort Beaufort.—Cold weather with light rain and snow. Veld in good condition. Wheat not doing so well on account of insect pests. Oats in good condition. All stock with the exception of ostriches in good condition. Ostriches are reported on favourably in Ward 4.

Peddie.—Veld in good condition, weather cold and windy with very little rain. Very small crop of cereals sown. Stock generally doing well.

George.—Considering the season the veld is in good condition and the rainfall has been heavy. The nights are very cold. Vines doing fairly well and cereals very well. Stock generally doing very well.

Hay.—Veld in fair condition, weather changeable and no rainfall. Stock dying of Lamziekte, great scarcity of horses. Sheep in more or less bad condition and Angoras scarce, with the exception of Ward 2 where they are doing well.

Hope Town.—Weather very cold with no rainfall. Very little grain grown in this district. Stock generally in fairly good condition.

Jansenville.—Weather cold and fine and veld in good condition. Apples and apricots fairly good. Cereals doing fairly well. Stock generally doing well.

Kenhardt.—Windy weather has been experienced and the veld is very dry. Stock generally in poor condition.

King William's Town.—Weather very cold and dry. Crop of cereals fairly good. Condition of cattle fair.

Knysna.—Weather distinctly cold with light rainfall. The orange is the chief fruit at this time of the year. On the whole the crops are looking well but are late. Stock generally in good condition.

Ladismith.—Weather cold and dry and condition of veld poor. Not a very good crop of cereals expected. Cattle, horses and pigs doing fairly well but sheep and goats in rather poor condition.

Lady Frere.—Condition of veld bad and no rains have fallen. Very little wheat and oats are grown but kafir corn is plentiful. Stock generally in bad condition.

Laingsburg.—Good weather but rainfall bad. Crop of wheat very light. Stock in good condition.

Malmesbury.—Very cold weather and veld in poor condition. Fair crop of cereals. Cattle somewhat poor, horses and goats and pigs doing fairly well.

Middelburg.—Rainfall very light with cold dry weather. Condition of veld fair. Very small crop of cereals. Stock generally in fairly good condition.

Molteno.—Very cold weather, high winds and no rainfall. Veld in poor condition. Grain suffering from drought and frost. Cattle in very poor condition and getting weaker. Horses in fair condition but feeling effects of drought and cold. Sheep doing fairly well and goats very well.

Mossel Bay.—Very cold weather and veld in fair condition. Only a fair crop of cereals promises so far. Stock generally doing fairly well.

Murraysburg.—During July the weather experienced was warm for this time of the year, but August commenced cold and windy. Veld in fairly good condition considering the fact that there has been no rain since May. Wheat and oats just coming up.

Oudtshoorn.—Weather has been very cold with heavy frost. On the 8th of August there was a severe snow storm accompanied with hail and sleet. Veld in extremely good condition. Cereals doing well. Stock generally in fairly good condition.

Philipstown.—Veld in very bad condition and no rain has fallen. Stock generally not inclined to do very well.

Port Alfred.—Veld in good condition with encouraging rainfall. Wheat and oats young. Stock generally doing well.

Prieska.—Average weather with light rainfall. Practically no grain is grown in this district. Stock generally doing fairly well.

Queenstown.—In some parts the veld is in good condition in others very dry. Dry weather with very severe frosts, sunny, warm days and not much wind. Fair quantity of wheat, oats, rye and barley sown. Stock generally in good condition.

Riversdale.—Veld in excellent condition, and weather fine. Fruit doing well, good crop of cereals. Stock generally in fair condition.

Robertson.—Weather cold and veld in good condition. Rainfall average. Some vines doing well, others troubled with Phylloxera. Wheat and oats seem to promise well although not much was sown. Stock generally doing well.

Somerset East.—Veld in good condition and weather cold and windy. Very good crop of cereals anticipated. Stock generally doing very well.

Springbokfontein.—Weather mild and fair. Veld in very bad condition. Vines in good condition. Stock generally in very bad condition.

Steynsburg.—Veld in very poor condition, and weather cold with no rain. Very little grain in the district. Ostriches are commencing to lay. Stock generally in fairly good condition.

Stockenström.—Fine weather with light rains. Condition of veld good for the time of the year. Scale in oranges, and Fruit Fly in other fruits. Very little wheat, oats and lucerne.

Stutterheim.—Strong winds have been blowing and the veld is very dry. Apples, apricots, pears, peaches and plums doing well. There are only a few vines, principally Cape Stock. Very little wheat is grown. Very good crops of oats and mealies. Stock generally in good condition. No Ostriches in this district.

Uitenhage.—Light rainfall with fine weather, and veld in very good condition. Very little fruit, oranges and naartjes. Oats and wheat promising. Stock generally in very good condition.

Upington.—Veld in fair condition but no rain has fallen. Stock generally doing fairly well.

Van Rhyns Dorp.—Veld in promising condition and weather cold with light rainfall. Oranges in good condition, wheat and oats promising. Stock generally in fair condition.

Victoria West.—Fair weather and veld in more or less good condition. Good crops of cereals, Stock generally in good condition.

Willowmore.—Light soft rains with calm but frosty weather. Veld in good condition. At present the crop of Lucerne is short but a fairly good season is expected later.

THE TRANSKEI.

For the month ending 31st July, 1906

Cofimvaba.—Little can be done at this season of the year in the way of agriculture. The weather has been very dry, the pasturage is poor and cattle and sheep are falling off in condition, but indications are not wanting of a change in the weather and should it bring on rain, the pasturage will soon freshen up. No fresh outbreaks of disease among cattle have been reported.

Flagstaff.—There is nothing to add to my report of last month. The weather has been seasonable. The veld is in poor condition and rain is badly needed. Stock, both large and small is in fairly good condition and free from disease.

Kentani.—No rains have fallen during the month. All agricultural operations will be at a standstill until after the Spring rains, about September. The pasturage is fair.

Kokstad.—There is nothing of special interest to report for the past month. No rain fell during the month. The veld in consequence is very poor. The frosts have been very sharp, in fact not known to be so heavy for many years. All live stock are, however, in very fair condition. No cases of disease have been reported.

Lusikisiki.—Veld very dry in parts, weather dry and very windy with no rain. Mealies and Kafir corn in very poor condition. Pigs doing very well, other stock in fair condition.

Matatiele.—There was no rainfall during the past month and as a consequence the veld is parched up and as dry as timber. The usual winds which as a rule prevail during the months of July and August have not yet commenced, in fact the weather has been for the greater part of the month most unseasonable. With the exception of a couple of cold days the weather has been as hot as early summer. Winter feed has almost given out. Unless early spring rains are experienced the outlook for cattle and horses is poor. Harvesting operations have now been concluded with very satisfactory results so far as the mealie and Kafir corn crops are concerned. All classes of stock are still in fair condition and are free from disease.

Mount Frere.—No rain fell during the month and the veld is very dry. The weather has been mild, and stock, though in parts falling off in condition, have not suffered much so far. No fresh outbreak of disease has been reported during the month. The herds quarantined have been carefully looked after and there are now only two badly infected; in one case the owner did not inoculate and in the other the cattle were drenched.

Nqamakwe.—The weather for July was mild and dry. Harvest of mealies now completed, and owing to drought since the end of last year the yield of mealies was not so good as first anticipated, but as far as can be ascertained the Natives have sufficient for their requirements. Condition of stock normal. No locusts have appeared in the district.

Willowvale.—Veld very dry, weather bright and warm with very light rainfall. Good Mealie crop. Cattle and goats in good condition for time of season, horses fair but sheep do not do well in this district.

Note.—A number of these reports have come to hand too late for insertion in this issue.

NOTES ON THE WEATHER OF JULY, 1906.

By CHARLES M. STEWART, B.Sc., Secretary to the Meteorological Commission.

The weather of July was characterised by unusually high mean pressure, exceptionally low temperatures with frequent, very severe frosts, a moderate amount of cloud with occasional fogs or mists, a practical absence of thunderstorms and hail, an abnormally small rainfall, less than half the usual amount, with some falls of sleet and snow towards the middle of the month, light winds and frequent calms with very few strong winds.

Division.	Mean Rainfall (1906).	Mean No. of Days.	Average Rainfall (1891-1900).	Average No. of Days.	Percentage Differences from Averages.	Actual Differences from Averages.
	Inches.		Inches.		Inches.	Per cent.
Cape Peninsula ..	2.58	12	6.39	12	— 3.81	— 60
South-West ..	1.57	6	3.10	7	— 1.53	— 49
West Coast ..	0.45	4	1.50	5	— 1.05	— 70
South Coast ..	1.60	5	1.41	5	+ 0.19	+ 13
Southern Karoo ..	0.19	1	0.64	3	— 0.45	— 70
West Central Karoo ..	0.21	2	0.31	2	— 0.10	— 32
East Central Karoo ..	0.07	1	0.24	2	— 0.17	— 71
Northern Karoo ..	0.03	1	0.34	2	— 0.31	— 91
Northern Border ..	0.00	0	0.17	1	— 0.17	— 100
South-East ..	0.19	2	0.62	2	— 0.43	— 69
North-East ..	0.01	1	0.56	2	— 0.55	— 98
Kaffraria ..	0.07	1	0.52	2	— 0.45	— 87
Basutoland ..	0.00	0	0.64	2	— 0.64	— 100
Orange River Colony ..	..	..	0.48	2	..	..
Durban (Natal) ..	0.28	3	1.30	..	— 1.02	— 78
Bechuanaland ..	0.00	0	0.33	1	— 0.33	— 100
Rhodesia ..	0.00	0	0.02	1	— 0.02	— 100

Precipitation.—The mean precipitation during this month, as shewn by 326 gauges, amounted to only 0.61 in. on 3 days, being 0.71 in. or 54 per cent. less than the normal. An examination of the accompanying table shews that the deficit was common to all the Divisions with the single exception of the South Coast which had a mean rainfall of 13 per cent. above the average. The deficiency was least, 32 per cent. over the West Central Karoo, whereas absolute drought prevailed at all stations over the Northern Border, Basutoland, Bechuanaland and Rhodesia; a similar state of affairs obtained over the greater part of the Karoo the North-East and some portions of the South-East. As a matter of fact the only divisions having a monthly mean of more than half-an-inch were the Cape Peninsula, the South Coast and the South-West; so that, generally speaking, it may be said that absolute or partial drought prevailed throughout the month over the whole of South Africa with the exception of the narrow coastal belt in the South and South-West. A summary of the monthly totals emphasises the severity of the drought, as out of 326 stations, 125 or 38 per cent. had *nil*; 128 had 0.01—1 inch; 47 had 1.01—2 ins.: leaving only 26 stations, situated wholly in the three divisions already particularised, with more than 2 inches. Of these, 15 had 2.01—3 ins.; 6 had 3.01—4 ins.; the remaining five (5) largest totals being, De Doorns, 4.39 ins.; Kasteel Poort (Table Mountain) 4.58 ins.; Newlands (Montebello) 4.49 ins.; Waai Kopje, 5.43 ins.; the maximum being 5.77 ins. at St. Michael's on Table Mountain. Naturally, the maximum falls in 24 hours were nowhere very large, as only 15 out of 322 stations furnishing details had more than 1 inch in any one day, leaving 182 with 0.01—1 in. and 125 with *nil*. The largest daily falls were 1.76 ins. at Ceres on the 5th; 1.54 ins. at Vijgeboom's River on the 15th; 1.48 in. at Bishopscourt, 1.38 in. at Kenilworth and 1.29 in. at Newlands all on the 14th. The only *Thunderstorm* reported occurred on the 1st at Port St. John's, while *Hail* was noted at only two (2) stations on the 15th and 31st. Falls of *Snow* occurred at 21 stations on 6 days, viz. 10th, 13th—16th and the 21st. It was most widely distributed on the 15th, its limits being approximately Qacha's Nek (Basutoland) and Evelyn Valley in the east, Sutherland and Nel's Poort in the West,

Ezeljagt and Buffel's Nek in the South Coast division in the South. The amount of snow, however, appears to have been comparatively small, although the ground was white on the 15th and 16th at Buffel's Nek. *Sleet* fell at 15 stations on 9 days of the month, viz., 1st, 12th to 16th and 29th to 31st, most widely on the 12th, 13th, and 15th.

Temperature, Cloud, and Wind—The unusually high mean pressure was accompanied by an abnormally low mean temperature of 51.3° , which is 2° below the average (53.3°) for the month, and 3.5° colder than in July, 1905. Compared with last month both maximum and minimum temperatures show a marked downward tendency, the mean maximum (63.7°) being 2.3° , and the mean minimum (39.0°) being 4.1° lower than the corresponding values for the preceding month. This continued drop in both curves is noteworthy, inasmuch as, although the average monthly temperature reaches its minimum in July, this is usually brought about by more intense nocturnal radiation, accompanied by increased solar radiation during the day; in other words, the usual condition is for the mean maximum temperature curve to show a marked upward tendency, while the mean minimum continues to fall. The deficit of the mean temperature for this month (1.3°) from the normal (53.3°) was unequally divided between the day and night temperatures, the mean maximum (63.7°) being 2.9° , and the mean minimum (39.0°) being 1.0° lower than usual, thus causing a reduction of 1.9° in the mean daily range (24.7°). The unusually cold weather appears to have been practically general over South Africa, the deficits in the monthly temperatures being mostly 3—4 degrees along the West and South-West Coasts, 2—4 degrees along the South Coast and apparently over the Southern Karoo, and 1—2 degrees elsewhere. Along the West and South-West Coast belts the deficiency was almost equally divided between the day and night temperatures, as was also the case at East London; along the South Coast at Port St. John's, and at Hopefontein, in Rhodesia, it was mainly due to a decrease in the day temperature, but elsewhere it was almost wholly due to the nights being much colder than usual. Our observer at Vrochtbaarc remarks that in consequence of the unusual severity of the season, "the earlier varieties of fruit are at least two weeks later than last year" in bursting into blossom! The mean warmest station was Port St. John's, with a temperature of 60.2° , and the mean coldest, Hanover, with 41.1° , a difference of 19.1° . The highest mean maximum of 70.7° was at Umtata, Port St. John's, coming next with 70.2° , while the lowest mean minimum was 23.3° at Hanover. The highest temperatures of the month were most commonly recorded on the 2nd in the South-West, on the 22nd along the South and East Coasts, and at some places in the Karoo, but inland the warmest day was most commonly the 28th although absolute maxima occurred on several intermediate dates, as the 6th at Hope Fountain. The coldest mornings were generally from the 13th to the 20th, particularly the 14th, or during Sutton's well-marked cold spell about the middle of July, although a few minima were noted on the 25th, 30th, and 31st. The mean of the absolute maxima was only 75.1° or 2.5° lower than in June, while the mean of the corresponding minima was 30.6° or 4.9° less than in the preceding month, there was, therefore a mean monthly range of 44.5° as against 42.1° in June, being an increase of 2.4° . The extreme readings for the month were 85.0° at Umtata on the 28th and 14.0° at Hanover on the 15th, 17th, and 25th, yielding an extreme monthly range over all stations of 71.0° .

Coincident with the unusually low mean minimum temperatures prevalent throughout the month, was the occurrence of an exceptionally large number of *Frosts*, 296 cases in all being reported. This phenomenon was so wide-spread, and occasionally of such severity in places—killing usually hardy vegetables and plants at Lady Frere, nipping orange-trees at Queenstown and even killing lucerne in patches at Oornarvon Farm—as to constitute one of the leading features of the weather of the month. These were of daily occurrence and were most numerous reported from the 13th to the 20th and on the 30th and 31st, but more particularly on the 16th and 17th.

The mean amount of *Cloud* during the month was 37 per cent. or the same as in June last, but 2 per cent. more than during the same month of last year. The skies were most obscured over the Cape Peninsula where the mean proportion covered was mostly about 65 per cent., it decreased eastward through 61 per cent. at Cape Agulhas to 32 per cent. at Bird Island, rising again to 44 per cent. at East London and 61 per cent. at Port St. John's. Elsewhere it varied mostly between 25 and 35 per cent., decreasing slightly on advancing inland, but dropped to 18 per cent. at Hope Fountain. The mean amount of cloudiness varied between 68 per cent. at Cape Point and 9 per cent. at O'okiep. There was a slight decrease in the number of *Fogs* or *Mists* reported during this month, altogether 74 instances being noted on 25 days. They were most numerous on the 1st, 15th, 23rd, 26th, 28th and 30th, none were reported on the 2nd, 6th, 11th and 17th to 19th.

As a consequence of the marked anticyclonic conditions which characterised this month, the winds were unusually light, with frequent calms,—the mean force being only 1·54, corresponding to a velocity of 10·7 miles per hour or 1·7 miles per hour less than in June, and 2·8 miles per hour less than in July, 1905. The prevailing winds were most variable over the Cape Peninsula, where there was a marked decrease in the number of north-westerly breezes, and where pressure was 1 inch higher than usual. Over the rest of the country there was a marked prevalence of cold westerly to north-westerly winds, except at O'okiep, where they were easterly; at Kimberley, where they were north-easterly; and at Hops Fountain, where they were south-easterly in direction. There was a marked absence throughout the month of strong winds, which were reported as attaining the force of a *Gale* at only 12 stations on 8 days, principally the 14th, 15th and 31st. The only *Hot Wind* noted during the month was that on the 21st at Uitenhage, whereas no instance of a *Dust storm* was reported.

OBSERVERS' NOTES, JULY, 1906.

VRUCHTBAAR.—Very dry; rainfall far below average for July. Hot during the day, with heavier frost during several nights than we have had for some years. Season for blooming of the earlier varieties of fruit, at least two weeks later than last year.

KERSFONTEIN.—The driest winter month on record.

THE TOWERS.—Heaviest frost for many years occurred on the 16th.

COURDALE.—Very severe frosts; strong winds, also cold West winds on several days during month.

SCHUILHOEK.—The latter part of month marked by excessive frost.

THE MEADOWS (Schoombie).—Weather has been very dry all the month, no signs of moisture. Farmers are trekking to pastures new.

WAVERLEY.—Very severe frost on the 11th–16 degrees.

PELLA.—Drought very severe.

CARNARVON FARM.—This has been the mildest July on record, *i.e.*, ten years. Only 15 frosts against an average of 23 for all the previous months of July. Most of the frosts have been mild, but on the 15th, 16th, and 17th the severity of the frost was awful 18 degrees on the 15th and 16th, and 16 degrees on the 17th. Lucerne, one of the hardiest of plants, was in patches killed to the roots. The reason for all this damage was the extremely dry atmosphere consequent on the prevailing drought. Thirteen cloudless days were recorded. Only eight windy days, the nearest approach to this for July was 13 in 1904. Cattle generally poor, but where chaff has been saved they are in better condition. Crops a failure generally, little only put in, and that that came up has been badly injured by frosts.

LADY FRERE.—The weather has been very peculiar. On some occasions real warm summer weather and again heavy frost—the most severe frost known for a number of years. Vegetables and peanuts which usually stand the winter well were killed by frost.

MIDDLECOURT.—There has been absolutely no rain or snow this month. Very severe frosts and dry cutting winds.

STERKSPRUIT.—Owing to continued drought, there is almost nothing in the way of seed sown as yet.

THIBET PARK.—Very severe frosts during the month.

VENTERSTAD.—Hard frosts throughout the month.

ELLIOTDALE.—Very dry month. High winds prevailed.

KOESTAD.—Country dry and parched. Very cold N.W. winds. Crops suffering for want of rain.

GROOT DRAKENSTEIN.—A very cold dry month. Temperature, wind, cloud, and rainfall all well below average.

Mean temperature of month, 4·9° below average 7 years (8° below July, 1905).

„ maximum 3·5°

„ minimum 6·4° „ „ 13 years.

Rainfall deficiency to date 8·19 in.

Total: January—July, 1906 14·13 in.

Average: January—July, 13 years 23·04 in.

This is the first monthly mean that has fallen below 50°; the previous coldest month being July, 1903, with 51·5°. The extreme minimum (32·2°) is also a record.

QUEENSTOWN (Berwick).—The frost on the 16th, 17th, and 18th was severer than for many years. Orange trees much nipped.

KOESTAD (The Willows).—Mostly calm days, continuous and sometimes severe nightly frosts; almost total absence of rain (0·03 in.). Monthly mean temperature lower than usual in July, marks the month. Veld very dry.

TEMPERATURE, JULY, 1906.

Stations.	Mean Max.	Mean Min.	Monthly Mean	Abs. Max.	Date.	Abs. Min.	Date.
Royal Observatory ..	58.8	44.2	51.5	69.0	2	35.3	18
Cape Town (S. A. College) ..	60.4	44.7	52.5	72.0	2	37.5	18
" " (Hospital) ..	59.2	45.6	52.4	70.0	2	40.0	18
Simon's Town ..	62.2	49.1	55.6	72.4	2	45.8	18
Sea Point ..	60.0	46.0	53.0	71.8	2	39.8	18
Wynberg ..	60.3	44.0	52.2	70.5	3	38.5	14
Groot Drakenstein ..	61.0	38.4	49.7	70.0	2	32.2	17
Robertson Plantation ..	64.4	38.1	51.2	75.0	20	29.0	16 & 17
Elsenburg Ag. College ..	58.7	38.6	48.6	68.8	2	32.5	17
Ceres ..	57.2	34.2	45.7	68.0	11	27.0	18
O'okiep ..	63.4	40.8	52.1	75.0	28	35.0	6
Port Nolloth ..	61.9	41.9	51.9	77.0	2	35.0	30
Port Elizabeth ..	65.0	49.6	57.3	77.0	23	38.0	14
George Plantation ..	62.2	44.0	53.1	70.0	22	35.0	14
Uitenhage ..	67.4	39.2	53.3	83.0	22	29.0	14
Cape St. Francis ..	63.1	47.7	55.4	73.0	18 & 20	34.0	16
Cape L'Agulhas ..	58.2	47.5	52.9	64.0	2	42.0	14
Storm's River ..	62.8	44.0	53.4	83.0	22	34.0	14
Heidelberg ..	67.1	39.5	53.3	76.0	6	29.0	17 & 18
Amalienstein ..	66.2	32.1	49.1	80.0	22	26.0	17
Hanover ..	58.9	23.3	41.1	67.0	22	14.0	15, 17 & 25
Murraysburg ..	61.6	30.5	46.0	74.0	28	19.0	15
Kimberley ..	67.4	38.6	50.5	77.0	28	25.2	16
East London ..	68.7	48.1	58.4	79.0	22	38.0	14
Sydney's Hope ..	62.9	45.4	54.2	76.5	22	35.0	16
Stutterheim ..	67.0	42.2	54.6	80.0	28	31.5	17
Bedford ..	66.9	39.0	53.0	82.0	29	28.0	14
Cathcart ..	62.2	37.0	49.6	74.0	29	25.1	14
Queenstown ..	65.5	31.8	48.6	79.0	28	51.0	15
Aliwal North ..	63.7	27.2	45.4	72.5	28 & 29	16.0	14
Rietfontein (Aliwal North)	58.9	28.0	43.4	68.0	28	17.3	14
Main ..	67.0	40.4	53.7	79.1	28	24.5	14
Mount Ayliff ..	69.6	41.1	55.4	81.0	27 & 28	31.0	13 & 16
Port St. John's ..	70.2	50.3	60.2	78.0	22	44.0	14, 15 & 19
Umtata ..	70.7	34.7	52.7	85.0	28	22.0	14
Kokstad (The Willows) ..	65.5	29.7	47.6	76.0	5 & 28	20.0	17
Tabankulu ..	67.3	39.8	53.6	78.8	28	29.0	14
Teyateyaneng ..	62.1	29.9	46.0	70.0	28, 29 & 30	16.0	16
Leribe ..	63.0	25.4	44.2	73.0	28	16.5	31
Kuruman ..	64.0	28.9	46.4	77.0	29	19.0	16
Hope Fountain ..	67.8	44.0	55.0	75.0	5	38.0	20
Means ..	63.7	39.0	51.3	75.1	..	30.6	..
Extremes ..	..	..	..	85.0	28	14.0	15 17 & 25

RAINFALL, JULY, 1906.

I. CAPE PENINSULA:

	INCHES.
Royal Observatory (a) 12 inch gauge ..	1.82
Cape Town, Fire Station ..	1.43
Do South African College ..	2.08
Do Sea Point (Hall) ..	1.52
Do do. (Attridge) ..	1.52
Do Molteno Reservoir ..	2.43
Do Platteklip ..	3.05
Do Signal Hill ..	1.38
Table Mountain; Disa Head ..	3.25
Do Kasteel's Poort ..	4.58
Do Waai Kopje ..	5.43
Do St. Michael's ..	5.77
Newlands (Montebello) ..	4.94
Bishopscourt ..	3.60
Kenilworth ..	2.98
Wynberg (St. Mary's) ..	2.90
Groot Constantia ..	2.35
Tokai ..	2.69
Simon's Town (Wood) ..	2.48
Do. (Gaol) ..	2.00
Robben Island ..	1.13
Camp's Bay ..	1.10
Fish Hoek ..	1.08
Cape Point ..	0.88
Durbanville ..	1.53
Plumstead ..	1.96
Muizenberg (Storage Res.) ..	3.81
Woodstock (Hall) ..	2.15
Do (Municipal Quarry) ..	3.48
Do (with Nephers Shield) ..	3.72
Maitland ..	1.42

II. SOUTH-WEST:

Eerste River ..	2.04
Klapmuts ..	1.75
Stellenbosch (Gaol) ..	1.05
Somerst West ..	1.78
Paarl ..	2.08
Wellington (Gaol) ..	1.64
Groot Drakenstein ..	2.15
Tulbagh ..	1.23
Kluitjes Kraal ..	0.41
Ceres ..	4.39
Caledon ..	1.43
Worcester (Gaol) ..	0.47
Hex River ..	0.36
Robertson ..	0.51
Porterville Road ..	1.59
Rawsonville ..	1.16
Robertson (Govt. Plantation) ..	0.55
Danger Point ..	1.36
Vijgebooms River ..	2.54
Elsenburg Agricultural College ..	1.56
Roskeen ..	1.19
Vruchtbaar ..	1.66

III. WEST COAST:

Port Nolloth ..	0.05
Klipfontein ..	0.14
Kraaifontein ..	0.03
O'okiep ..	0.17

III. WEST COAST:—continued

	INCHES
Springbokfontein (Gaol) ..	0.34
Concordia ..	0.12
Garies ..	0.02
Kersefontein ..	0.40
The Towers ..	0.89
Dassen Island ..	0.74
Malmesbury ..	1.12
Piquetberg ..	1.68
Van Rhynsdorp ..	0.32
Clanwilliam (Tronk) ..	0.36
Anenous ..	0.17
Zoutpan ..	0.59
Wupperthal ..	0.51

IV. SOUTH-COAST:

Cape L'Agulhas ..	1.09
Bredasdorp ..	1.29
Swellendam ..	1.33
Heidelberg ..	0.74
Riversdale ..	0.32
Vogel Vlei ..	0.65
Mossel Bay ..	0.70
George ..	0.79
Ezelzagt ..	0.22
Millwood ..	0.76
Sour Flats ..	1.12
Concordia ..	2.04
Kuysna ..	1.81
Buffels Nek ..	1.20
Harkerville ..	2.37
Plettenberg Bay ..	1.35
Blaauwkrantz ..	1.83
Storm's River ..	1.64
Witte Els Bosch ..	2.23
Cape St. Francis ..	1.53
Great Brak River ..	0.38
Witteklip ..	0.94
Uitenhage ..	0.25
Do (Inggs) ..	0.16
Do (Park) ..	0.18
Port Elizabeth (Harbour) ..	1.81
Tankatara ..	0.06
Lottering ..	1.41
Shark's River (Nursery) ..	1.86
Do (Convict Station) ..	1.70
Karnmelks River ..	1.82
Zuurbraak ..	1.21
Armadaile ..	0.09
Centlivres ..	0.23
George (Woodfield) ..	0.95
George (Plantation) ..	0.76

V. SOUTHERN KAROO:

Ladismith ..	0.38
Amalienstein ..	0.43
Calitzdorp ..	0.00
Oudtshoorn ..	0.00
Uniondale ..	0.55
Kleinpoort ..	0.00
Glencormor ..	0.00

VI. WEST CENTRAL KAROO:

	INCHES
Prince Albert Road ..	0-00
Fraserburg Road ..	0-00
Prince Albert ..	0-05
Zwaartberg Pass ..	1-10
Beaufort West ..	0-22
Nel's Poort ..	0-06
Willowmore ..	0-16
Steytlerville ..	0-09

VII. EAST CENTRAL KAROO:

Aberdeen (Gaol) ..	0-08
Aberdeen Road ..	0-00
Winterhoek ..	0-11
Kendrew ..	0-00
Graaff-Reinet ..	0-13
Do (College) ..	0-12
New Bethesda ..	0-08
Jansenville ..	0-00
Patrysfontein ..	0-08
Toegezicht ..	0-00
Klipfontein ..	0-00
Pearston ..	0-00
Somerset East ..	0-10
Cornedale, (Div. Aberdeen) ..	0-00
Darlington ..	0-04
Buffel's Nek ..	0-42
Glen Harry ..	0-11
Bloemhof ..	0-10
Spitzkop (Graaff-Reinet) ..	0-00

VIII. NORTHERN KAROO:

Calvinia ..	0-33
Sutherland ..	0-19
Fraserburg ..	0-00
Onderste Doorns ..	0-00
Gannapan ..	0-00
Carnarvon ..	0-00
Victoria West ..	0-00
Britstown ..	0-00
Murraysburg ..	0-00
De Kruis ..	0-24
Hanover ..	0-00
The Willows ..	0-00
Middelburg ..	0-00
Tafelberg Hall ..	0-00
Craddock ..	0-00
Witmoos ..	0-00
Steynsburg ..	0-00
Quagga's Kerk ..	0-16
Tarkastad ..	0-05
Omdraais Vlei ..	0-00
Varken's Kop ..	0-00
Fish River ..	0-00
Wildebeestkooij ..	0-00
Maraisburg ..	0-00
Waverley ..	0-03
Schuilhoek ..	0-00
Jackalsfontein (Div. Colesberg) ..	0-00
Ezelpoort do ..	0-00
Plaatsberg do ..	0-00
Grapevale do ..	0-00
Ezelsfontein do ..	0-00
Groenkloof do ..	0-00

VIII. N. KAROO—continued

	INCHES
Rodepoort (Div. Colesberg) ..	0-00
Vlaakfontein do ..	0-00
Vogelsfontein do ..	0-00
Plaatfontein do ..	0-00
Vosburg ..	0-00
Zwavelfontein ..	0-00
The Meadows (Schoombie) ..	0-00
Theefontein, (Div. Hanover) ..	0-00

IX. NORTHERN BORDER:

Pella ..	0-00
Kenhardt ..	0-00
Van Wyk's Vlei ..	0-00
Prieska ..	0-00
Dunmurry ..	0-00
Griqua Town ..	0-00
Douglas ..	0-00
Avoca (Herbert) ..	0-00
Kimberley (Gaol) ..	0-00
Do (Harrison) ..	0-00
Bellsbank (Div. Barkly West) ..	0-00
Barkly West ..	0-00
Upington ..	0-00
Trooilspan ..	0-00
New Year's Kraal ..	0-00
Strydenburg ..	0-00

X. SOUTH-EAST:

Melrose ..	0-07
Fairholt ..	0-05
Cheviot Fells (Bedford) ..	0-01
Bedford (Gaol) ..	0-02
Do. (Hall) ..	0-10
Sydney's Hope ..	0-36
Cullendale ..	0-09
Adelaide ..	0-12
Atherstone ..	0-32
Alexandria ..	1-11
Salem ..	0-37
Graham's Town (Gaol) ..	0-37
Heatherton Towers (near Graham's Town) ..	0-12
Fort Beaufort ..	0-15
Katberg ..	0-00
Balfour ..	0-14
Seymour ..	0-21
Port Alfred ..	1-03
Hogsback ..	0-20
Thaba N'doda ..	0-30
Peddie ..	0-30
Cathcart ..	0-00
do (Forman) ..	0-02
Keiskama Hoek ..	0-00
Thomas River ..	0-00
King William's Town ..	0-08
Stutterheim (Besté) ..	0-01
Dohne ..	0-05
Dagga Boer ..	0-06
Crawley ..	0-00
Kubusie ..	0-06
Kei Road ..	0-00
Evelyn Valley ..	1-73
Berlin ..	0-00
Isidenge ..	0-72
Perie Forest ..	0-35

X. SOUTH-EAST— <i>continued</i>		INCHES	XII. KAFFRARIA :— <i>continued</i>		INCHES
Quacu Forest ..	..	0 00	Cofimvaba ..	..	0 00
Kologha ..	..	0 10	Nqamakwe ..	..	0 22
Fort Jackson ..	..	0 00	Main ..	..	0 00
Komgha ..	..	0 00	Engcobo ..	..	0 03
East London, West ..	..	0 09	Butterworth ..	..	0 06
Do East ..	..	0 03	Kentani ..	..	0 12
Fort Cunynghame ..	..	0 01	Maclear ..	..	0 00
Bolo ..	..	0 02	Willowvale ..	..	0 17
Fort Fordyce ..	..	0 09	Mount Fletcher ..	..	0 00
Sunnyside ..	..	0 31	Elliotdale ..	..	0 00
Forestbourne ..	..	0 36	Mqanduli ..	..	0 10
Cata ..	..	0 14	Umtata ..	..	0 02
Wolf Ridge ..	..	0 35	Kokstad ..	..	0 00
Dontsah ..	..	0 17	Do (The Willows) ..	..	0 02
Mount Coke ..	..	0 00	Umzimkulu ..	..	0 00
Blackwoods ..	..	0 03	Tabankulu ..	..	0 15
XI. NORTH-EAST :			Somerville (Div. Tsolo) ..	..	0 02
Venterstad ..	..	0 00	Bazeya ..	..	0 00
Ellesmere ..	..	0 00	Owebe ..	..	0 15
Burghersdorp ..	..	0 00	Mount Ayliff ..	..	0 14
Molteno Station ..	..	0 00	Flagstaff ..	..	0 22
Thibet Park ..	..	0 00	Insikeni ..	..	0 02
Sterkstroom ..	..	0 00	XIII. BASUTOLAND :		
Rocklands ..	..	0 00	Mohalie's Hoek ..	..	0 00
Aliwal North (Gaol) ..	..	0 00	Qacha's Nek ..	..	0 00
Do (Brown) ..	..	0 00	Teyateyaneng ..	..	0 00
Rietfontein ..	..	0 00	Leribe ..	..	0 00
Buifelsfontein ..	..	0 00	Maseru ..	..	0 00
Carnarvon Farm ..	..	0 01	XV. NATAL :		
Jamestown ..	..	0 00	Durban, Observatory ..	..	0 28
Queenstown (Gaol) ..	..	0 00	XVII. BECHUANALAND		
Do (Beswick) ..	..	0 03	Vryburg ..	..	0 00
Dordrecht ..	..	0 02	Taungs ..	..	0 00
Tylden ..	..	0 00	Setlagoli ..	..	0 00
Herschel ..	..	0 00	XVIII. RHODESIA :		
Lady Grey ..	..	0 00	Hope Fountain ..	..	0 00
Bolotwa, Contest ..	..	0 04	Matopo Park ..	..	0 00
Lady Frere ..	..	0 00			
Barkly East ..	..	0 05			
Lyndene ..	..	0 00			
Mooifontein ..	..	0 00			
Poplar Grove ..	..	0 00			
Whittlesea ..	..	0 00			
Halseton ..	..	0 00			
Middlecourt ..	..	0 00			
Sterkspruit ..	..	0 00			
Blikana ..	..	0 02			
Albert Junction ..	..	0 00			
Glen Wallace ..	..	0 00			
Indwe ..	..	0 00			
Bensonvale Inst. ..	..	0 00			
Rhodes ..	..	0 13			

CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 18th August, 1906, ruling at the several centres named, is published for general information:—

CENTRE.	A	B.	C.	D.	E.	F.	G.	H	J.	K	L.	M.	N.	O.	P.	Q.
	Wheat per 100 lb.	Wheat Flour, per 100 lb.	Boer Meal per 100 lb.	Mealies per 100 lb.	Mealie Meal per 100 lb.	Barley per 100 lb.	Oats per 100 lb.	Oat-hay per 100 lb.	Pota- toes per 100 lbs.	Tobacco (Boer Roll, per lb.	Beef per lb	Mutton per lb.	Fresh Butter per lb.	Eggs, per doz.	Cattle (Slaughter) per lb.	Sheep (Slaughter)
Alwal North	£ s. d. 0 9 0	£ s. d. 0 13 6	£ s. d. 0 14 0	£ s. d. 0 7 6	£ s. d. 0 6 6	£ s. d. 13 6	£ s. d. 10 6	£ s. d. 0 5 0	£ s. d. 0 7 6	£ s. d. 1/6 to 4/-	£ s. d. 3d to 3d to 9d	£ s. d. 3d to 3d to 9d	£ s. d. 0 2 4	£ s. d. 1 6	£9 to £10	91/-
Beaufort West	0 12 0	0 17 0	0 13 0	0 9 0	0 12 6	10 6	10 6	0 7 0	0 7 6	0 10	*3d to 1s	*3d to 1s	0 1 6	1 6	£13	25 6
Burgersdorp	0 9 6	0 7 0	0 10 3	0 8 6	0 9 0	8 0	7 6	0 7 6	0 8 0	1/4, 1/3, 1/6	7d to 1s.	8d, 9d, 10d	0 2 0	1 6	£16 to £20	25/-
Cape Town	0 11 0	1 7 0	0 12/6 to 1s	0 13 0	...	9 6	10 6	...	10/6 to 1s	0 1 0	0 8	7d to 8d	1/6 to 1 9	1 6	...	21/-
Clanwilliam	0 9 0	...	...	0 13 0	...	9 6	10 6	...	10/6 to 1s	0 1 0	0 8	7d to 8d	1/6 to 1 9	1 6	...	...
Oudberg	0 9 0	...	...	0 13 0	...	9 6	10 6	...	10/6 to 1s	0 1 0	0 8	7d to 8d	1/6 to 1 9	1 6	...	...
Craddock	0 9 0	...	...	0 13 0	...	9 6	10 6	...	10/6 to 1s	0 1 0	0 8	7d to 8d	1/6 to 1 9	1 6	...	...
Dordrecht	0 13 6	0 13 6	0 10 6	0 7 0	0 17 6	6 0	...	0 5 0	0 8 0	0 7 3	0 5	...	0 1 9	1 6	...	...
East London	0 11 6	0 11 6	0 11 0	0 7 0	0 7 6	5 6	...	0 5 0	0 8 0	0 1 0	0 8	...	0 1 9	1 6	£10	97/-
Graaff-Reinet	0 13 0	...	...	0 7 0	0 7 6	4 9	...	0 5 0	0 8 0	0 1 1	...	...	0 1 9	1 6	£21	18/-
Graham's Town	0 10 6	0 14 6	0 12 6	0 8 6	0 6 6	8 0	9 6	0 6 0	0 12 6	0 0 6	...	...	0 1 1	1 6	£10	...
Kimberley	0 7 6	0 14 6	0 12 6	0 8 6	0 7 9	4 0	8 0	0 3 0	0 15 0	0 0 7	0 10	...	0 1 1	1 6	£19 to £13	18/- to 20/-
King Wm's Town	0 7 6	0 14 6	0 12 6	0 8 6	0 7 9	4 0	8 0	0 3 0	0 15 0	0 0 7	0 10	...	0 1 1	1 6	£14	£1 5s.
Meerburg	0 10 0	0 15 0	0 18 0	0 16 0	0 11 0	4 0	8 0	0 4 0	0 14 0	0 0 4	3d. to 9d.	3d to 9d	0 1 3	1 6	£13 10s	...
Mossel Bay	0 10 0	0 15 0	0 18 0	0 16 0	0 11 0	4 0	8 0	0 4 0	0 14 0	0 0 4	3d. to 9d.	3d to 9d	0 1 3	1 6	...	...
Port Alfred	0 10 0	0 19 0	0 15 0	0 10 0	0 12 6	5 6	5 6	0 5 0	0 10 0	0 0 9	0 8	...	0 1 3	1 6	...	...
Port Elizabeth	0 6 3	0 11 0	0 6 6	0 6 3	0 5 0	5 6	5 6	0 5 0	0 13 6	0 0 4	0 8	...	0 1 3	1 6	...	...
Queen's Town	0 10 0	0 13 0	0 12 0	0 8 6	0 11 0	6 0	7 0	0 5 0	0 13 6	0 0 4	0 8	...	0 1 3	1 6	£19, 14s	23/- to 29/-
Tarkenton	0 11 6	0 18 0	0 14 3	0 7 6	0 9 0	8 0	10 0	0 7 6	0 10 0	0 0 6	0 10	...	0 1 3	1 6	£13	18/-
Vredenburg	0 10 0	0 13 6	0 10 0	0 7 6	0 8 6	3 0	7 6	0 5 0	0 8 6	0 0 6	7d to 9d	*6d to 1s	0 1 3	1 6	£10 to £15	22 - to 25/-
Worcester	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

NOTE.—A blank space denotes "no transactions.

* Colonial

† Frozen.

DEPARTMENTAL NOTICES.

Introduction of Horned Cattle from the British Bechuanaland Protectorate.

The following regulations regarding the introduction of Horned Cattle into the Colony from the British Bechuanaland Protectorate are issued under Proclamation No. 262, dated August 6, 1906 :—

1. The Cattle must be accompanied by a certificate from a Government Veterinary Surgeon of the British Bechuanaland Protectorate that they are free from disease, that there is no known case of Rinderpest or of African Coast Fever in the Protectorate, and that they have been dipped to the satisfaction of that Officer before being entrained; or that, failing such dipping, the cattle will be detained at Ramathlabama Railway Station and dipped at the tank at Ramathlabama Spruit, under such arrangements as may be approved by the Chief Veterinary Surgeon of the Cape Colony.
2. The cattle must be entrained in trucks thoroughly cleaned and disinfected.
3. The cattle must not enter the Cape Colony until inspected by a Cape Government Veterinary Surgeon and until such Officer has issued a certificate permitting such entry.

Regulations for the Introduction of Sheep into the Colony by Land.

The following regulations are published under Proclamation No. 246 of 1906, dated July 23 :—

1. In these Regulations the term "sheep" includes "goats."
2. No sheep shall be introduced into the Colony from any neighbouring State, Territory, or Colony, except from Natal into East Griqualand, unless:
 - (a) They shall be accompanied by a certificate in the form set forth in Schedule A hereto, signed by an Inspector of Stock appointed to administer Scab Laws or Regulations in such neighbouring State, Territory or Colony, stating that such sheep have been inspected by him on a date not more than fourteen days previous to the date of introduction and found free from Scab and have been thereafter properly dipped under his supervision in a dip approved by Government Notice No. 711 of 1906, or any subsequent Notice, or in a dip made of tobacco or sulphur; and with respect to sheep introduced from the Transvaal, that they have been dipped in an approved arsenical dip.
 - (b) In respect of sheep introduced by road, such certificate shall have been before their introduction endorsed by the Sheep Inspector of the District or area into or through which such sheep shall enter in manner provided in Regulation 3.

Or unless:

- (a) They shall be accompanied by a certificate in the form set forth in Schedule B hereto, signed by an Inspector of Stock appointed to administer Scab Laws or Regulations in such neighbouring State, Territory, or Colony, stating that such sheep have, save and except sheep introduced from the Transvaal been at least twice dipped in a dip approved by Government Notice No. 711 of 1906 or any subsequent Notice, or in a dip made of tobacco or sulphur; and with respect to sheep introduced from the Transvaal, that they have dipped in any dip aforesaid and at least a second time in an approved arsenical dip; provided that the dipping shall in each case have taken place within fourteen days of date of introduction; and at interval of not less than fourteen days and not more than eighteen days between each dipping.
 - (b) In respect of sheep introduced by road, such certificate shall have been before their introduction endorsed by the Sheep Inspector of the District or area into or through which such sheep shall enter in manner provided in Regulation 3.
3. No person intending to introduce sheep by road shall be permitted to introduce such sheep unless he shall have obtained the aforesaid endorsement, and he shall with that view give timely notice to the Resident Magistrate of the District in this Colony into or through which the sheep are to enter the Colony, stating the number of sheep, some place distant not more than three miles outside the border of the Colony, where

of such notice the Resident Magistrate shall forthwith communicate the same to the Sheep Inspector of the District or area into which the sheep are intended to pass, and such Inspector shall proceed at the time and to the place specified in such notice, or so soon thereafter as may be possible, then and there to examine such sheep.

4. The person in charge of such sheep shall be bound to produce the certificate aforesaid to the Inspector, and such Inspector shall, if he is satisfied that the sheep have been properly dipped according to Regulation 2, and if they are free from scab, make an endorsement on the certificate in the form given in Schedule C, and the sheep may thereafter proceed on their way.

5. If the certificate be incomplete in any particular, or if upon examination of such sheep the Inspector is not satisfied that the sheep have been properly dipped according to Regulation 2, or if he discovers the existence of scab among them, he shall refuse to allow them to enter his area until they shall have been again dipped once or twice as he shall see fit, and a second certificate in the form prescribed in Schedule A or Schedule B, as the case may require, shall have been by him given in respect of them.

6. If the sheep be forwarded from the neighbouring State, Territory or Colony by railway, the notice prescribed in Regulation 3 shall be sent to the Resident Magistrate of the District to which the sheep are destined to be conveyed, and such Resident Magistrate shall communicate the same to the Sheep Inspector of the District or area in which is situated the Railway Station to which such sheep are consigned, or where there shall be no such Inspector, to some deputy duly appointed for the purpose. The certificate provided in Regulation 2 shall be sent by the owner or sender to the Stationmaster or other official at a station or siding in such State, Territory or Colony, for delivery to the guard of the train by which such sheep are conveyed, and shall be by the guard in turn delivered to the Inspector or such official on arrival at the destined station or siding, or to the Stationmaster or official in charge of such station or siding.

7. Upon arrival at the destined station or siding the Sheep Inspector or duly appointed deputy, as aforesaid, shall, if he is satisfied that the sheep have been properly dipped according to Regulation 2, and if they are free from scab, make an endorsement on the certificate in the form given in Schedule C, and the sheep thereafter may proceed on their way, provided that until the certificate shall have been so endorsed, the sheep shall not be delivered by the railway officials to any person without the leave of the Commissioner of Public Works, after consulting with the Secretary for Agriculture, but the Inspector or duly appointed deputy shall have authority to direct that such sheep shall be dealt with in accordance with the Scab Act and these Regulations.

8. If the certificate be incomplete in any particular, or if upon examination of such sheep the Inspector or duly appointed deputy is not satisfied that the sheep have been properly dipped according to Regulation 2, or if he discovers the existence of scab among such sheep, he shall, before making the endorsement in the preceding section provided for, dip them once or twice, as he shall see fit, at the cost of the owner of such sheep, and such cost shall be recovered by means of the sale at public auction of so many of such sheep as may be required to defray such cost.

9. If such sheep be forwarded by railway, from the Orange River Colony, or from any State, Territory, or Colony, in which any law for the prevention of scab among such sheep shall be in force, consigned direct to a butcher for slaughter purposes, it will suffice if they are accompanied by a certificate issued by an Inspector of Stock appointed to administer Scab Laws or Regulations in such State, Territory, or Colony, for the prevention of scab among sheep, to the effect either that the said sheep are free from scab or that they have been properly dipped under the supervision of such Inspector, and have been marked with a special paint or tar mark, which certificate shall as nearly as possible follow the form prescribed in Schedule D of these Regulations.

10. The person in charge of such sheep so consigned, or the person consigning the same shall be bound to produce or deliver or cause to be delivered the certificate aforesaid to the Sheep Inspector of the District or area to which such sheep are destined, or where there shall be no such Inspector to the deputy duly appointed for the purpose, and such Inspector or deputy shall, if the certificate be in order, and the sheep are free from scab, make an endorsement to that effect on the certificate and the proviso to Regulation 7 shall apply to all sheep so introduced.

11. If the certificate be incomplete in any particular, or if upon examination of such sheep, the Inspector or deputy aforesaid discovers the existence of scab among them, he shall cause them to be dipped once under his supervision before delivery or removal.

12. Any person contravening these Regulations shall, upon conviction, be liable to a fine not exceeding twenty pounds sterling.

SCHEDULE A.

(Regulations published in Proclamation No. 246, 1906.)

IMPORTATION OF SMALL STOCK OVERLAND.

CERTIFICATE

Of dipping of Sheep and (or) Goats specified herein :—

Name of Owner

Address

In charge of

Farm and locality from which to be removed.....

Place in Colony to which to be removed.....

Sheep.	Number.	Marks.	Goats.	Number.	Marks.
Merinos ..	—	—	Angoras ..	—	—
Cross-bred Sheep ..	—	—	Cape Goats ..	—	—
Cape Sheep ..	—	—			

Inspected by me on

and found free from Scab.

Date subsequently dipped in dip.

Inspector of Stock appointed to administer Scab Laws or Regulations.

Dated at District.

on 190..

Note.—The dipping must be within 14 days of the date of introduction.

The dip must be either tobacco, sulphur, or one of the patent dips approved by Government Notice No. 716 of 1906, or any subsequent notice, and in the case of sheep introduced from the Transvaal, the dipping must be performed in an approved arsenical dip.

SCHEDULE B.

(Regulations published in Proclamation No 246, 1906.)

IMPORTATION OF SMALL STOCK OVERLAND.

CERTIFICATE

Of dipping of Sheep and (or) Goats specified herein :—

Name of Owner

Address

In charge of

Farm and locality from which to be removed

Place in Colony to which to be removed

Sheep.	Number.	Marks.	Goats.	Number.	Marks.
Merinos ..	—	—	Angoras ..	—	—
Cross-bred Sheep ..	—	—	Cape Goats ..	—	—
Cape Sheep ..	—	—			

Date of first dipping in dip

Date of second dipping in dip

Inspector of Stock appointed to administer Scab Laws or Regulations.

Dated at District

on 190..

Note.—The interval between each dipping must not be less than 14 and not more than 18 days, and the second dipping must be within 14 days of the date of introduction.

The dip must be either tobacco, sulphur, or one of the patent dips approved by Government Notice No. 711 of 1906, or any subsequent notice, and, in the case of sheep introduced from the Transvaal, the second dipping at least must be performed in an approved arsenical dip.

SCHEDULE C.

ENDORSEMENT TO BE MADE BY THE INSPECTOR.

I hereby certify that I have examined the sheep to which this certificate refers and find them to have been dipped in accordance with Regulation 2 of Proclamation No. 246 of 1906, and to be free from scab.

Sheep Inspector District.

Dated at on 190 ..

SCHEDULE D.

IMPORTATION OF SLAUGHTER STOCK.

I, hereby certify that I have this day examined the {sheep} owned by and running on the {goats} farm in the Field-cornetcy and that the {sheep} are free from scab or have been properly dipped under my supervision and marked with a special mark in {point} {ear}.

Inspector of Stock, appointed to administer Scab Laws or Regulations.

..... District.
Dated at on 190 ..

GUANO FROM GOVERNMENT ISLANDS.

It is notified that the price of Guano, *delivered free at any Government Railway Station in the Colony*, or at the following Depots, Caledon, Malinesbury, Pearl and Worcester, will be as follows, viz. :—

Ordinary Guano, £6 per ton of 2,000 lbs., or 12s. per bag of 200 lbs.	}	For use within limits of the Colony.
Rock Guano, £6 7s. per ton of 2,000 lbs., or 12s. 9d. per bag of 200 lbs		
A bag is the smallest quantity which will be supplied.		
Ordinary Guano, £7 12s. per ton of . . 2,000 lbs.	}	For use beyond limits of the Colony.
Rock Guano, £8 per ton of 2,000 lbs.		
Plus cost of railage from Cape Town		
Free railage will not be allowed on the <i>backward</i> journey on supplies drawn from the depots.		

Rock Guano is not stocked at the Depots. Remittances in cash, cheque or Post Office Money Order, in advance, must be made or sent, for *Guano from Cape Town*, to the Superintendent of the Guano Islands, No. 69 Strand Street; and from the depots to the Railway Station Masters.

Government Notice No. 1326, dated 11th December, 1905, is hereby cancelled.

BARRY McMILLAN,

Acting Chief Clerk to the Secretary for Agriculture.

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town. Members of Farmers' and Fruit Growers' Associations applying for same through the Secretaries of these Associations are supplied free of charge.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V of *Agricultural Journal*.

Artificial Grasses and Fodder for Stock; Ensilage; Treatment of Cereal and other Crops; Viticulture and Wine Making; Forestry; Locusts and their Destruction; Possible New Industries for Cape Farmers; Stock Farming; Dairying; Fruit Culture (6d.)

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Brak Land in Relation to Irrigation and Drainage (1d.); The Velvet Bean (1d.); Potato Disease (1d.); Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d.); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (3d.); The Salt Bushes (1d.); Tobacco Culture by P. Borcemisza (1d.); The Cultivation of Tobacco in the Colony by K. Schenck (3d.); Tobacco Wilt in Kat River Valley (1d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d.); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); †Dairy and its products by D. Hutcheon (2d.); *Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Cabbage Aphis (1d.); Codling Moth in Madeira Fruit (1d.); *Codling Moth (1d.); Fruit Fly (1d.); Fumigation Supplies (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d.); *Peach Yellows (1d.); Pear Slug, Paris Green (1d.); Remedy for Mestwurmon (1d.) *Spray Calendar (1d.); *Spray Pump Notes (1d.); Scale Insects on Ornamental Trees and Plants (1d.); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d.); Fumigation under Box Covers (1d.); The House Fly (1d.); New Oak Tree Pest (1d.); Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.); Another Introduced Scale Pest (1d.); Washes for Red Scale (1d.); Fruit Fly: Peach Fly (1d.); Lime-Sulphur-Salt Wash for Scale Insect (1d.); The Fruit Moth (1d.); Fusieladium of the Apple and Pear (1d.); Mealie Stalk Borer (3d.)—coloured plate: Cleaning up Nursery (1d.); Natural Enemies of the Fruit Fly: Report on Investigations in Brazil (1d.); Locust Birds and Locust Poison (1d.); The Brazil Fruit Fly Parasites (1d.); Cyanide Gas Remedy for Scale Insects (3d.)

Forestry.

British National Forestry (1d.); Botanical Observations on Forests in Eastern Pondoland (1d.); †Elementary Principles of Sylviculture or Woodcraft (1d.); National Forests (1d.); Indigenous Timbers of the Cape (1d.); Misuse of Coal and the Uses of Forests (1d.); Tree Planting for Timber and Fuel (1d.); Tree Planting for Farmers (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Fisheries.

Trout and Carp Breeding and Stocking of Streams (1d.); *Methods of Preserving Fish by Smoking (1d.); Portable Floating Hatching Box for Trout Ova (1d.); The Protection of Trout (1d.); The Ocean and its Resources (1d.)

Horticulture

Fruit Culture in the Gamtoos River Valley (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (8d.); The Olive at the Cape (2d); Tomatoes and Fruit for Export (1d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.); *Fruit from Orchard to Buyer (1d); Netting for Fruit Trees (1d.); Fruit Culture in Argentina (1d.); Vegetables for Exhibition (1d.) Chrysanthemum Rust (1d.)

Veterinary and Animal Industry,

*Anthrax, Charbon, Miltzbrand or Miltziekte (1d.); *Heartwater (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d.); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstock's Report on Inoculation for Rinderpest (1d.); *Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.); *Sheep and Wool (1d.); The Eye and its Diseases (1d.); Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhoea in Calves (1d.); Persian Sheep and Heartwater (1d.); Poisoning of Stock (1d.); Retention of the Fœtal Membrane, or Afterbirth in Cows (1d.); Stijziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Tuberculosis and the Use of Tuberculin (1d.); African Coast Fever with Description of Dipping Tank (3d.); *Rinderpest in South Africa (3d.) by D. Hutcheon; *Fluke or Slak in Liver of Sheep (3d.)—*coloured plate*; *Anthrax or Miltziekte and Quarter Evil or Sponsziekte (1d.); Osteo Porosis (3d.)—*coloured plates*; *Glanders (3d.)—*coloured plate*; *Animal Castration (1d.); *Preventive Inoculation for Redwater (1d.); *Abortion in Cattle (1d.); Treatment for Worms in Domestic Animals (1d.); *Lungsickness of Cattle, Contagious Pleuro-Pneumonia, or Pleuro-Pneumonia-Bovum-Contagiosa (1d.); *Swine Fever, Hog Cholera or Pig Typhoid (3d.)—*coloured plates*; Castration of Females and Animals other than the Horse (1d.); Poisoning of Horses by *Ornithogalum Thyrsoides* or Chinkerinchee (*coloured plate*) (3d.); Diseases of the Horse and their Treatment (1s.); Horse Sickness by D. Hutcheon (2d.); Ticks and African Coast Fever (1d.); Cirrhosis of the Liver in Stock (1d.); Liver Disease among Calves (3d.); The Arsenite of Soda Dipping Mixture (1d.); *Lampas.

Viticulture.

†Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d.); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d.); Manufacture of Dry Wines in Hot Countries (3d.)

Miscellaneous.

Game Seasons (3d.); Land Laws of Cape Colony (1d.); †Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c. 1d.); Bars in Ostrich Feathers (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

THE PRODUCE MARKET.

CAPE TOWN.

Mr. R. Müller, of Strand Street, Cape Town, supplies the following report for the month ending August, 20th:—

Ostrich Feathers.—The market has been well supplied. Some good pluckings have been offered, and the prices realised were satisfactory. For superior quality there is a good demand at full rates, while common lots are neglected and may be quoted five per cent. lower.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.		
Super Primes	10	0	0	35	0	0	Floss	..	0	5	0	1	10	0	
Firsts, Ordinary							Long Drabs	..	2	10	0	4	10	0	
to Super	..	8	0	0	10	0	0	0	0	0	2	0	0		
Seconds	..	5	0	0	7	10	0	Medium Drabs	..	1	5	0	2	0	0
Thirds	..	3	10	0	4	10	0	Short to Medium	0	10	0	1	10	0	
Femina (super)	7	10	0	9	10	0	Floss.	..	0	2	6	1	10	0	
Femina, Seconds							White Tails	..	1	15	0	3	0	0	
to Firsts	..	4	0	0	6	10	0	Coloured Tails	..	0	10	0	1	15	0
Byocks (fancy)	..	5	0	0	7	10	0	Chicks	..	0	1	0	0	2	0
Long Blacks	..	4	10	0	7	10	0	Spadonas	..	2	10	0	4	0	0
Medium Blacks	3	0	0	3	10	0	Inferior Black &								
Short to Medium	0	10	0	2	10	0	Drabs, Short								
							to Long	..	0	0	6	1	10	0	

Wool.—Arrivals during the month were small, it being between seasons. A few odd parcels were offered, which consisted mostly of medium grown Karoo Grease, suitable for washing purposes. Some lots of good quality Paarl Snow Whites were withdrawn, as there are no orders in the Market at present. Later advices from London report a partial recovery of prices at the close of the July Sales and there appears to be more confidence in Wool trade circles, condition being considered healthy.

	s.	d.	s.	d.		s.	d.	s.	d.
Super Long Grass Veld					Short and Inferior	..	0 4	0 4½	
Wool ..	0	8	0	9½	Wool for Washing	..	0 4½	0 6	
Super Long Karoo Veld					Snow-white Super to Extra	1	7	1 10	
Wool ..	0	6¾	0	7½	„ Ordinary	1	1	1 6	
Medium Karoo Veld Wool	0	5	0	5½	Fleece Washed	..	0 0	0 9½	

Mohair.—The Market is quiet and few transactions have taken place, except in Winter Hair, for which 11½d. was realised. News from Bradford report, that, although no large transaction have taken place, the trade is in a healthy condition.

	s.	d.	s.	d.			s.	d.	s.	d.
Mohair, Firsts, Summer	1	1	1	3½	Mohair Winter	..	0	10½	1	0
„ Kids..	..	1	3	1 7	„ „ Kids	..	1	0	1	3
„ Seconds	..	0	6½	0 9½						

Hides and Skins.—In sympathy with the fall in prices of Wool at the London Sales, Sheep Skins have declined, there is, however, a good demand for all classes. Hides are firm at unchanged prices.

	s.	d.	s.	d.		s.	d.	s.	d.		
Long Wool Skins	..	0	6½	0	6½	Cape Skins (cut), each	..	1	3		
Short	..	0	6	0	6½	Goat Skins, heavy to					
Shorn	..	0	6	0	6½	light	..	0	11		
Bastards	..	0	6	0	6½	Sundried	..	..	0	7	
Cape Skins, each	..	2	0	2	3	Angoras	..	0	6½	0	7½
Sundried Hides								
Salted			For Shipment	{	0	6	0	8½
Wet				{	0	6	0	7½
							{	0	4½	0	5½

PORT ELIZABETH.

Messrs. J. Daverin and Co., report under date August 17 :—

Ostrich Feathers.—There was again a full three days' sale held this week, when the usual average assortment was offered. Competition was rather irregular, except for super qualities, which brought full prices; all averages and common qualities being rather in favour of buyers. The shipments which have gone forward for the London October sales amount to about £250,000. The total quantity sold on our public market this week weighed 4,465 lbs. 8½ozs. and realized £9,079 9s. A fair amount of business was also done out of hand at current prices.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
Primes : Extra super				Special Prices.			Blacks : Long..	2	10	0	4	0	0
Good to super	9	0	0	12	10	0	Medium ..	1	0	0	2	5	0
Whites : Firsts	8	0	0	10	10	0	Short ..	0	10	0	0	15	0
Seconds	5	10	0	7	10	0	Wirey ..	0	1	0	0	1	0
Thirds	3	0	0	4	10	0	Floss ..	0	6	0	1	5	0
Feminas :							Drabs : Long ..	1	5	0	2	15	0
Tipped (Firsts)	5	10	0	9	0	0	Medium ..	0	12	6	1	0	0
Seconds	4	0	0	5	0	0	Short ..	0	2	6	0	6	0
Thirds	2	0	0	3	0	0	Wirey ..	0	0	6	0	1	0
Greys	4	10	0	6	10	0	Floss ..	0	6	0	1	5	0
Fancy	4	10	0	7	0	0	Spadonas : Light	2	0	0	4	0	0
Tails : White	1	7	6	3	0	0	Dark ..	0	12	6	1	15	0
Light	0	17	6	1	15	0	Chicks ..	0	0	3	0	1	6
Coloured & Dark	0	5	0	0	17	6							

Wool.—This market continues dull and depressed for all old Wools, and to effect sales very low prices have to be accepted. A few small orders have come in for snow-whites, which enabled us to sell about 100 bales at what must now be considered satisfactory prices. There is a fair demand for any new season's long wool at fair prices. Writing under date the 28th ultimo, our London correspondents report :—"The interval until the sales re-open on the 25th of September is a long one, and the available total then is likely to be under 100,000 bales, so that we are of opinion that prices are likely to be maintained. Looking further ahead, the prospects for the industry from the manufacturer's standpoint are good, but it seems reasonable to anticipate that larger supplies will be absorbed only to a somewhat lower level of prices." On our public market yesterday only a few small lots were offered the bulk of which were withdrawn at low bids,

Snow white Extra						Grease, Short, faulty			
Superior ..	19½d	20d				and wasty ..	5d	5½d	
Snowwhite Superior ..	17½d	19½				Grease, Coarse and			
Do Good to Superior	16½d	17d				Coloured ..	4½d	4¾d	
Do Inferior Faulty	16d	16½d				Scoured Coarse and			
Grease, Super Long, well-						Coloured ..	6½d	10½d	
conditioned, Grass-						Basuto Grease, short..	6d	6½d	
veld grown (special						O. R. C. Grassveld			
clips) ..	8½d	9½				Grease, long and			
Grease, Super Long, well-						well - conditioned			
conditioned, Grass-						(special clips) ..	6½d	7d	
veld grown ..	6½d	7½d				O. R. C. Grassveld			
Grease, Super Long, well-						Grease, long and			
conditioned, Karoo						well-conditioned ..	5¾d	6½d	
grown (special clips)	6½d	7d				O.R.C. medium grown,			
Grease, Super Long,						light, with little			
well conditioned						fault ..	6d	6½d	
Karoo grown ..	5¾d	6½d				O.R.C. short, faulty			
Grease, Super Long,						and wasty ..	5½d	5¾d	
well - conditioned,						O.R.C. Karoo grown,			
Mixed Veld ..	5¾d	6½d				long and well-			
Grease, Light, faultless,						conditioned ..	5¾d	6½d	
medium, Grassveld						O.R.C. medium grown,			
grown ..	5½d	6½d				light, with little			
Grease, Light, faultless,						fault ..	5d	6d	
medium Karoo						O.R.C. short, faulty			
grown ..	5½d	6½d				and wasty ..	4½d	5d	
Grease, Light, faultless,									
short Karoo grown	5½d								

R. MÜLLER, 77, STRAND STREET, CAPE TOWN,

Pays **HIGHEST** prices for:—

**WOOL, OSTRICH FEATHERS,
MOHAIR, SKINS, HIDES,
and other PRODUCE.**

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All goods warranted best quality. Lowest market prices.

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Samples and Price Lists on Application.

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35, Wale Street, CAPE TOWN.

(One Door above Loop Street.)

Mohair.—This market remains at a standstill, the only sale made during the week being of 25 bales new season's average winter, at 11½d. Our London agents report as follows re the prospects for this market:—"Consumption still proceeds at the same satisfactory rate - - - and we see no reason to alter our opinion as to the sound position of the article. Manufacturers, however, pursue their waiting policy, and the result is an absence of any business of importance." On the public market on Tuesday, only a few odd bales and bags were offered, and prices ruled very low.

Super Kids .. 1s 6½d	1s 7d	Mixed O.R.C. Hair	
Ordinary Kids .. 1s 4d	1s 5d	(average) .. 0s 11½d	1s 0½d
Superior Firsts, special clips .. 1s 3½d	1s 3½d	Very Mixed O.R.C. Hair (average) .. 0s 10½d	0s 11d
Ordinary Firsts .. 1s 3d	1s 3½d	Seconds and Grey .. 0s 8d	0s 9d
Short Firsts .. 1s 1d	1s 1½d	Thirds .. 0s 6¾d	0s 7d
Superfine Long Blue, O.R.C. Hair .. 1s 2½d	1s 3½d	Winter Kids .. none offering.	
		Do. Hair .. do.	

Skins.—Sheepskins sold in bundles at 6¾d. per lb.; Pelts at 5½d.; Capes, 2s. 1d.; damaged, 7d. each; Angoras, 81.; Shorn, 5½d.; damaged, 3½d.; Goat, 12d.; damaged, 5¾d. per lb.; Springbok, 8d. each.

Hides.—Sundried Hides sold this week at 8d., and damaged at 6d.; Drysalted, 7½d.; damaged, 5½d., and Thirds 3½d.

Horns.—Parcels all round sold at 3½d. each.

MONTAGU.

Agricultural Returns and Prospects, July and August, 1906.

FROM THE CIVIL COMMISSIONER.

Montagu, meteorologically, may be described, more particularly, with regard to its cultivable area, as being too far East to be West; too far West to be East; too far North to be South; and too far South to be North. It is too far East to experience seasons of moisture like those known in the Western Province in winter; although the rainy season pretty fairly corresponds, the weather breaking about April, and ending in September or October. The many intervening ranges and masses of mountains intercept much of the moisture carried along by the winter gales, so that the rainfall is comparatively limited—between 12 and 16 inches annually. It is too far West to be East, as it is rarely visited by Thunder Storms, although at times they are very violent. Only one occurred during the year—on the 11th March—which, while very smart during its continuance, only lasted half an hour. Montagu is again too far South to be North, as it has not the aridity of the Karoo, nor its elevation—this basin being only about 850 feet above the sea level, and is not so far from the Coast as to prevent its deriving some benefit from the southerly winds in summer, mitigating the great heat and making the nights endurable. It is again too far North to be considered a coastal or littoral district, and gets no benefit from S.E. rains, such as occur in places lying on the south side of the extensive Langeberg range during the summer gales. The summer past was an exceedingly dry one, and marked by great heat as well, which had a serious effect on the vines and other fruit crops, considerably diminishing the yield. For the week, 19th February to the 25th, the average maximum temperature was 100°F, the Thermometer on one occasion registering 110·2°. The quality of the wine was, however, very good, as no rain fell on the grapes to do them damage during the critical time of maturing. A slightly diminished output is not, however, regarded as an unmixed evil. Rain has fallen each month, from April with fair consistency, so that agricultural operations have not been retarded. For the months of July and August combined, which this report is intended to cover, the rainfall has been fair, even if not heavy, eleven days having been recorded by me to date.

Weather.—The weather has been very cold, heavy frosts have been experienced, and much snow and hail have covered the surrounding mountains. The condition of the veld is rather poor, but will soon improve with the advent of some warm days. The ground is, however, of such a hard, tenacious character that it is not very responsive to light rains. It is boschjesveld, not grassy clad.

Fruit.—Oranges and naartjes are the principal fruit at this season, and the crops are good, but the market is lifeless at present. Most of the fruit is still on the trees.

Vines.—All vineyards are now pruned and being dug over, and the vines will shortly be shooting their first spring leaves.

Cereals.—Not much wheat is sown in this district owing to rust, but a considerable acreage is under oats and barley, with some rye in suitable localities. The principal fodder crop, on which our farmers build great and increasing store, is lucerne. This valuable green stuff is being largely cultivated—new lands being continuously set down with it. At present all fodder is very scarce and expensive—oatsheaves being practically unobtainable—horses being fed with chaff and mealies and a little rye—and such green forage as is grown in small patches and vineyards.

Cattle.—This is not a large cattle district, and what there are are mostly in poor condition, but will improve with the season. They are not of high class stock as a rule. Horses, Mules, etc.—Some good horses are owned, but the area is not a great horse-breeding district, but with such sires as the thoroughbred "Pericles" and the Hackney "Matchless" and others, the stock will continue to improve, although the absence of a continuous supply of good fodder is a drawback to young animals. Horses average £25 to £30, donkeys £5 to £6. Sheep, etc.—No merinos in this division, principally goats and Persian sheep are run, as being most suited to the hilly and bushy character of the country. They are reported generally as being in not very good condition. Some local butchers are importing slaughter sheep from the district of Beaufort West in consequence. No Angora goats are farmed.

Ostriches.—Ostrich farming is carried on very extensively, and the stock is being vigorously added to by breeding. Large camps exist in all parts of the district, and the additional lucerne fields are needed to feed the birds. Owing to the protracted drought of the late summer and the scarcity of food, there were a good many casualties among the birds. In order to provide food I have seen the birds fed on the leaves of the common aloe cut up into cubes of suitable size. The birds eat these palatable morsels readily, and, I am told, with advantage, as they are free from sickness and the ailments to which they were previously prone. Aloes should constitute a good vermifuge.

Pigs.—Pigs are kept on practically all the larger holdings, but chiefly for home consumption. My report is lengthy, but may for all practical purposes be taken to embrace a much wider period than the months to which it ostensibly refers.

BREEDERS' DIRECTORY.—(See Page 442.)

THE POULTRY YARD.

PRIZE and UTILITY POULTRY of the BEST ENGLISH and AMERICAN STRAINS.—WHITE WYANDOTTES—PARTRIDGE WYANDOTTES—SILVER-PENCILLED WYANDOTTES—BARRED PLYMOUTH ROCKS—WHITE LEGHORNS—BROWN LEGHORNS—BUFF LEGHORNS—WHITE LA BRESSE. Stock and SETTINGS OF EGGS FOR SALE. Correspondence invited.—S. SMITH, Talana, Wellington Avenue, Wynberg.

BUFF ORPINGTONS.

THE FARMER'S FOWL. The fowl that LAYS WHEN EGGS ARE TOP PRICE and are also A 1 table birds. My Buffs have unlimited orchard and grass run, and are noted for hardiness and good laying qualities. Young stock always for sale at very reasonable prices. Ask for inclusive quotations;

carriage paid to any station in South Africa and AT MY RISK to rail destination. My list of prizes won at shows all over South Africa will convince you that this unrivalled *Colonial* strain of 9 years' standing CAN HOLD ITS OWN AGAINST IMPORTED STOCK. Buy hardy Colonial-bred birds and save your pocket. Eggs from pure-bred utility strain, 12/6. Address: A. C. BULLER, Dwarsriviershoek, Stellenbosch.

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MAMMOTH AMERICAN BRONZE.—HARDY STRAIN OF GREAT SIZE. Noted prize winners. Young stock for sale after April. Orders booked now. Ask for inclusive quotations. Carriage paid to any station in South Africa and AT MY RISK to rail destination. Eggs in season. Full particulars from A. C. BULLER, Dwarsriviershoek, Stellenbosch.

BREEDERS' DIRECTORY.

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HORSES.

Hugh A. Wyndham, Kromdraai Stud, near Standerton, Transvaal. Stud Stallions, Season 1906-1907. Broxton, d.b.h., 15-3. He is very well bred, being by Ayrshire, winner of the Derby, out of Farewell, winner of the 1,000 guineas, by Doncaster, winner of the Derby, out of Lily Agnes, dam of Ormonde, winner of the Derby, her dam Polly Agnes by the Cure—Miss Agnes by Irish Birdcatcher. Thoroughbred mares, £10 10s.; limited number of approved mares, £5 5s.

Narhillah, ch. h., 15 hands, by Baliol, out of Little Nell, by Lammermoor. He won several steeplechases in England, and ran seventh in the Grand National in 1904. Thoroughbred mares, £7 7s.; approved mares, £3 3s.

CATTLE.

SHORTHORNS.

Turpin, Geo. W., WATERFORD, KURUSIE STATION, CAPE COLONY. Breeder of Pedigree Lincoln Red Shorthorn cattle. Young bulls always for sale.

JERSEYS.

Thoroughbred Herd. Celebrated Island bred bull "Clove," and several of the best cows and heifers from Mr. H. W. Struben's late herd.—Mrs. A. A. Dunn, De Tuin, Piquetberg.

FRIESLANDS.

Pure Frieslands. Enquire for cows, young bulls, and heifers. Oldest pure herd in Eastern Province. Grand milkers. Prize stock. Also, Colonial Rambouillet Flock Rams, limited number.—F. F. WIENAND, Bellevue, Bedford, C.C.

R. Cross, HILLSIDE, P.O. BOLOTWA. Will have high-class Friesland bulls for sale from February next. Herd may be seen by appointment. Bulls from Imported and Colonial Cows.

SHEEP.

MERINOES.

T. T. Hoole, ATHERSTONE, ALBANY. Breeder of PURE CHANGAILIAN PEDIGREE MERINOES. Late imported. *King Billy 39th*. Grand Champion. Champion and First, National Association, Brisbane, 1904. First Prize, family group and winner of ten other first prizes.

A. H. Murray, PORTLOCK, GRAAFF-REINET. Breeder of Rambouillet Sheep. Good combination of mutton and wool. Rams for sale from £3. Orders now booked for past season's lambs, to deliver 1907.

Rambouillet Rams, from Colonial Ewes, by Imported and Colonial sires. Sold at all Bedford Ram Fairs. Partridge Wyandottes and Indian Runner Ducks' Eggs.—PRINGLE BROS., Glen Thorn, P.O. Linton, Adelaide.

OSTRICHES.

Specials only.—Chicks, £5 to £20 each; Young Birds, £10 to £30.—F. W. BAKER, Laughing Waters, Willowmore.

GENERAL.

H. Vermaak, The Pines, Maraisburg, Cape Colony, has on hand and for sale at very reasonable prices, PURE-BRED FRIESLAND BULLS and PURE-BRED MERINO RAMS of the RAMBOUILLET breed.

THOROUGHbred PERSIAN RAMS and OSTRICHES.—Hougham Abrahamson, Long Hope Siding, C.C. Breeder of Rams from progeny of ewes passed into Stud Book. of Cape Breeders' Association. Also selected Breeding Ostriches.

PASPALUM GRASS PLANTS.—Quotations for plants, in bags free on rail Stellenbosch (keep moist long distance). See *Agricultural Journal*, May, 1906, page 622, or from A. C. BULLER, Dwaarsriviershoek, Stellenbosch.

W. Bullen, P.O. Box 1354, Cape Town, Breeder and Importer of Game, Houdans, Leghorns, Orpingtons, Wyandottes, Ducks, Geese, Homing and Fancy Pigeons at lowest prices (all risk taken).

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All communications should be addressed:

“The Editor, Agricultural Journal, Department of Agriculture, Capetown.”

Telegraphic Address: “Bulletin,” Capetown.

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NOTES.

Animal Diseases Act Amendment Act, 1906.

The public are notified that His Excellency the Governor will be recommended to promulgate the "Animal Diseases Act Amendment Act, 1906," on the 1st January next, and that the provisions of the Act in question will not, therefore, be brought into operation until that date.

The Free List.

Attention is again called to the proposed change in the Free List. All farmers desirous of receiving the *Agricultural Journal* free from the beginning of 1907, must see that their names and full postal addresses are registered with the Civil Commissioner and Resident Magistrate of their respective districts before November 15. Secretaries of Agricultural Societies, Farmers' and Fruit Growers' Associations, etc., will also please note and see that their lists of members are filed in the same way in time. The old lists cannot be relied upon now, as they have been in use over two years, and many changes have occurred during that period which have not been notified to this office.

Distribution.

We have to thank those gentlemen who have notified the receipt of duplicate copies of the *Agricultural Journal*, and trust others will follow suit. Removals, deaths, and changes of addresses frequently give rise to the continuation of the publication when it should be stopped. Will our readers please note, and assist us by returning unnecessary copies as early as possible?

Farmers' Wants.

A correspondent writes, suggesting that a page of the *Agricultural Journal* should be devoted to advertisements of farms for sale or hire. In reply we may point out that we have set aside a section for general farming wants and Breeders' notices, which seems to be filling fairly well. There is no reason why the notifications desired could not be published in the same way if readers so wish it. These matters rest with the advertisers themselves.

Collar Rot or "Mal-di-gomma" in Citrus Trees.

The report on the failure of citrus trees in Piquetberg, submitted by Mr. P. J. Cillie, and published in another part of the present issue, makes interesting reading. As the writer remarks, it should prove an object-lesson of great value to citrus growers to learn of the effects of the treatment prescribed. The causes traced by Mr. Cillie have also a deep interest for citrus growers, for the question of manures and their application is of vital importance in their bearing on successful citrus cultivation. The information that so many orchards in that district are recovering from *mal-di-gomma* under the treatment recommended by the Citrus Commission, is most gratifying, and it is to be hoped that more growers will follow suit. Should any of our readers interested in citrus culture desire information on this subject, we may state that copies of that valuable report (both English and Dutch) are still available for distribution, and may be obtained on application to the Editor of the *Agricultural Journal*.

The Disadvantages of Seedling Citrus Trees.

It will be noticed that Mr. Cillie, in the same report, calls attention to one of the more serious disadvantages of the seedling tree in citrus culture. The seedling is very much favoured by most of our farmers for many reasons which it is unnecessary to state here. But so many make the mistake of not sufficiently studying its disadvantages, that it is useful to have attention drawn to them now and again. The initial mistake usually made is in not planting them sufficiently far apart to allow of the great growth a healthy seedling tree makes. This means that as they develop they tend to impede and choke each other by leaving insufficient space for light and air. To allow for this, it is necessary that seedlings should be planted about forty feet apart, otherwise they must be thinned out as they grow. Another point for consideration that should never be lost sight of, is that of allowing for preventive measures against insect pests such as red scale and the like. Mr. Cillie draws particular attention to this in his concluding remarks. It is almost impossible to fumigate a full-grown seedling orange tree in any circumstances, and quite impossible when they are planted close together, as is so often the case in many of our districts most favourable to the production of citrus fruits on a large scale.

Australian and Canadian Apples.

Both the Australian and Canadian Governments having been warned that in consequence of diseased apples being shipped to this Colony, the Secretary for Agriculture now feels justified in taking steps to prevent such fruit being landed here in future, the

Australian Government has replied stating that full publicity has been given to that warning in the press, and customs officers in all the States have been instructed to warn shippers as well. The Minister for Trade and Customs of the Australian Commonwealth also forwards copy of an Act—the Commerce Act of 1905—under which, regulations are to be enforced, providing that the export of fruit (and other goods) shall be prohibited, unless there shall be applied thereto a “trade description,” indicating, *inter alia*, that the fruit is sound. The fruit is to be examined by an officer prior to export, and if found to be in the condition indicated, will be stamped “approved for export.” This system, it is hoped, may remove the danger of the exportation of diseased fruit. We may add that it is expected that all consignments of apples sent to our ports from Canada will in future be examined by Government inspectors before despatch, with the view of eliminating parcels which would not be acceptable here.

The Classification of Merino Sheep at Agricultural Shows.

The Hon. Wm. Rogers, M.L.C., writes:—“As the time is fast approaching for the numerous agricultural societies to fix up their prize lists for 1907, I take the liberty of throwing out a suggestion to all whom it may concern whether the time has not arrived for making an alteration in the classification of merino sheep at the forthcoming shows. In the past, exhibitors of merino sheep at shows have been bound down to a most useless and fruitless competition in what is called robust and fine-woolled classes. Breeds of fixity of type, which should form the basis of stud breeding in the country, have counted for nothing, although it is a singular fact that agricultural societies recognise the principle when framing their prize list for other stock. For instance, horses, cattle, pigs, dogs, and even poultry, are specially classified for the maintenance and improvement of any special point for which they are noted. If fixity of type is considered of such importance for the preservation of certain strong points in the animals and poultry referred to, how much more necessary is it that these valuable characteristics, displayed in a marked degree in so many forms in the stud flocks of sheep in this colony, should be doubly and jealously guarded. In England almost every county has its special breed of sheep, breeds which are more profitable to keep on certain pastures, and under certain climatic conditions. Such, for instance, are the Leicesters, Lincolns, Shropshires, Cotswolds, Oxfords, Hampshires, Dorsets, and many more. These sheep are not classed at shows for the character of the wool they produce, but are entered for competition as breeds of sheep. Each breed has a speciality most suitable to a locality. The sheepman, knowing this, casts about at the shows in search of the best animal of that particular strain, and he gets it.

"I have often thought that the present system adopted by agricultural societies, in limiting competition to robust and fine woolled breeds, is largely responsible for the backward condition of the sheep farming industry of the country and the non-success of many men who have embarked on the sheep-rearing and wool-growing business. Two ideals have constantly and persistently been paraded before the eyes and minds of sheep-men in this colony. Some lost their wits in the scramble to exhibit at shows wools of the most exquisite fineness, when the pasture and climate of their farms were ill-adapted to keep the delicate animals which produced such wool in a thrifty condition. The more advanced sheep-men have discovered that there are four breeds of sheep which adapt themselves fairly well to one or more of our multifarious sheep districts of South Africa. These are the Vermonts, Rambouillets, Tasmanian and Australian breeds.

"I would therefore humbly suggest to the various committees of agricultural societies that before framing their prize list they drop the vague and useless competition of robust and fine woolled sheep and substitute in their stead the more rational classification of breeds, to which I have just referred. I would very much like to hear your opinion on this matter Mr. Editor, and also the opinions of your readers who are desirous of building up in South Africa breeds of stud sheep to suit the various pastures and climatic conditions which nature has so lavishly bestowed on this young country of ours."

The point raised by Mr. Rogers, though interesting and of some value in itself, is, we fear, far from practicable. In the first place each of the so-called "breeds" he enumerates are, after all, only types of the same family. In the second place he overlooks the fact that the main object of the merino sheep's existence is the production of wool, and as such he must always be judged first and last. Again we may point out that in all the "breeds" mentioned by Mr. Rogers there are both robust and fine-woolled animals. The difficulties in the way of the reform suggested are, therefore, at once obvious. As the question has been raised, however, we should like to hear the opinion of other sheepmen on the whole subject of re-classification for that is what it all amounts to. It is certainly high time we had a change, and the direction most likely to help sheepmen would be first of all to do as is done in Australia and sort the sheep into "Housed" and "Unhoused" classes. At present the pampered stall-fed animal competes with his veld-fed brother. This, in our opinion, is where reform is needed.

Transverse Strength of Clanwilliam Cedar.

On the 7th June, 1906, a number of beams cut from dry trees on the Cedarberg were tested in the wood testing machine of the South African College. The test took place in the presence of the Chief Conservator, Mr. Beard of Messrs. Arderne & Co., and others interested. The size and breaking weight of the twelve beams tested is given in the following table. If we reject specimen numbered 158, which was not a sound beam, the average strength of the remaining eleven beams is represented by P. = 321. The maximum strength, it will be observed, was beam No. 160, which broke at 508. It may be noted that the mean transverse strength of Teak is 600.

In presenting his report Professor Henry Payne (head of the Engineering Staff of the South African College) states that in every beam broken a brown disease was observed to be running along the fibre of the timber. This brown disease was perhaps due to the trees having been cut dry, and it may have materially reduced the strength of these samples.

Test No.	Transverse Dimensions.		Effective Span in inches.	Centre breaking weight in pounds.	Co-efficient of Transverse Strength in lbs. per sq. inch.	Value of P.
	Breadth in inches.	Depth in inches.				
158	3.77	5.79	60	3,490	2,485	138
159	3.87	5.82	60	7,100	4,875	271
160	2.90	6.93	60	14,150	9,143	508
121	2.72	6.78	60	7,425	5,346	297
220	1.00	1.925	36	350	5,101	283
221	1.00	2.00	36	300	4,050	225
222	0.88	1.91	36	300	5,047	280
223	0.90	1.925	36	400	6,479	360
224	0.92	1.92	36	460	7,324	407
225	1.95	2.80	48.5	950	4,519	251
226	2.00	2.80	48.5	950	4,406	245
227	2.80	1.95	48.5	1,060	7,243	402
Average ..				3,040	5,776	321

The Wine Show.

The Western Province Board of Horticulture announces the holding of its Annual Wine Show for the 1906 Vintage on Wednesday the 24th inst., in the Offices of the Western Province Agricultural Society, Parker's Buildings. The following is the Prize list:—

SECTION A. WHITE WINES.

	1st Prize.			2nd Prize.			3rd Prize		
	£	s.	d.	£	s.	d.	£	s.	d.
Class 1.—Best 10 Leaguers Wine of the Hock type, (Light White Wines) ...	7	10	0	4	10	0	3	0	0
Class 2.—Best 10 Leaguers Wine of Sauterne type (White Wines between Hock and Sherry type)		Do.	...		Do.	...		Do.
Class 3.—Best 10 Leaguers Wine of Sherry type, (Heavy White Wines)		Do.	...		Do.	...		Do.
Class 4. — Best 5 Leaguers Sweetish White Wine, Madeira type)		Do.	...		Do.	...		Do.
Class 5.—Best 5 Leaguers Sweet White Wine		Do.	...		Do.	...		Do.

SECTION B. RED WINES.

Class 6.—Best 10 Leaguers Wine of the Claret type, (Light Red Wines) ...	...	Do.	...	Do.	...	Do.
Class 7.—Best 10 Leaguers Wine of the Burgundy type, (Full-bodied Wines) ...	...	Do.	...	Do.	...	Do.
Class 8.—Best 5 Leaguers Heavy Dry Red Wine, (Port type)	...	Do.	...	Do.	...	Do.
Class 9.—Best 5 Leaguers Heavy Sweetish Red Wine (Sweet Port type) ...	...	Do.	...	Do.	...	Do.
Class 10.—Best 5 Leaguers Sweet Red Wine ...	...	Do.	...	Do.	...	Do.

SECTION C. BRANDIES AND LIQUEURS.

Class 11.—Best 2 Leaguers Wine Brandy ...	...	Do.	...	Do.	...	Do.
Class 12.—Best 2 Leaguers Dop Brandy ...	...	Do.	...	Do.	...	Do.
Class 13.—Best Half-Aum, Van der Hum! ...	...	Do.	...	Do.	...	Do.

SECTION D.

Prizes Presented by J. W. JAGGER, ESQ., M.L.A.

Class 14.—Best 10 Leaguers

Light White Wine ... Silver Cup value £10.

Class 15.—Best 10 Leaguers

Light Red Wine ... Do. Do. £10.

All entries close on Oct. 17. Further particulars can be obtained of the Secretary, Mr. A. A. Persse, Parkers' Buildings, Cape Town.

Imported Berkshires.

The Porter Reformatory, at Tokai, has just imported from England a thoroughbred, pedigree, Berkshire boar Polegate Dissension, farrowed 18th June, 1905, by Cecil Augustus, No. 7756, dam, Polegate Debora, No. 9158; breeder, Her Grace the Duchess of Devonshire. Prize winner at Nottingham Show, 1906, At the same institution they have eight thoroughbred, pedigree Berkshire boars, from two to three months old, for sale, out of Highclere Nancy (imported), by Bascot Rob (imported), both prize winners.

Notice to Live Stock Exporters.

Official intimation has been received from South Australia that the Government of that Colony has decided, in order to prevent the introduction of rinderpest, or cattle plague and other contagious diseases, to prohibit for a period of twelve months the importation into South Australia of any live stock from Africa, south of the fifth parallel of south latitude. Any arriving in face of the proclamation will be seized and destroyed.

Feeding and Watering of Live Stock conveyed by Rail.

The attention of senders of live stock is drawn to Clause 29 of the Cape Government Railways Tariff Book which reads as follows :—"Senders of live stock are desired in all cases to state at the time of booking whether they wish the animals off-loaded, fed and watered en route, and if so, at what depôt stations. The animals must not be detained more than twenty-four hours, otherwise they will be charged as for two separate journeys. Under either circumstance the reloading charge of 2s. 6d. per short truck is made. Food, for the use of animals during the journey is conveyed free of charge when carried in the same truck, provided that the quantity does not exceed 100 lbs. for each large animal, *i.e.*, horses, mules, foals, cattle and donkeys, or five small animals, *i.e.* calves under three months of age, sheep, goats, ewes and pigs, and that the stock is consigned for a distance exceeding 100 miles. Carriage is to be paid on the weight of food taken delivery of at the end of the journey."

FARM AND VELD.

The Castration of Ostriches.

Mr. P. M. Southey, of Montagu, (P.O. Nørval's Pont) writes:—
“It may be interesting to you and Mr. Elley, Government Veterinary Surgeon, to hear the result of my experience in the castration of Ostriches. Some 17 or 18 years back we tried the experiment. This was on Varken's Kop and several adjoining farms, I cannot quite remember how many we operated on, certainly over a dozen. The result, however, was discouraging. Different aged birds were castrated, from about $2\frac{1}{2}$ to 5 or 6 years old. The young cocks never got their proper blacks, and appeared to be of a rusty nature, no gloss or quality, and the same applies to the older birds. They lost the richness of their blacks and whites. The condition of the birds as far as I can remember, was slightly better than the others. One bird we operated on for vice, but it made no difference to his nature. He was just as vicious as he had ever been before and was eventually killed while tackling a native. Should you require further particulars I may be able to furnish you with same.”

It would be most interesting if Mr. Southey, or others who have had experience, would communicate their impressions for publication. The subject is of great interest to many.

Marram Grass.

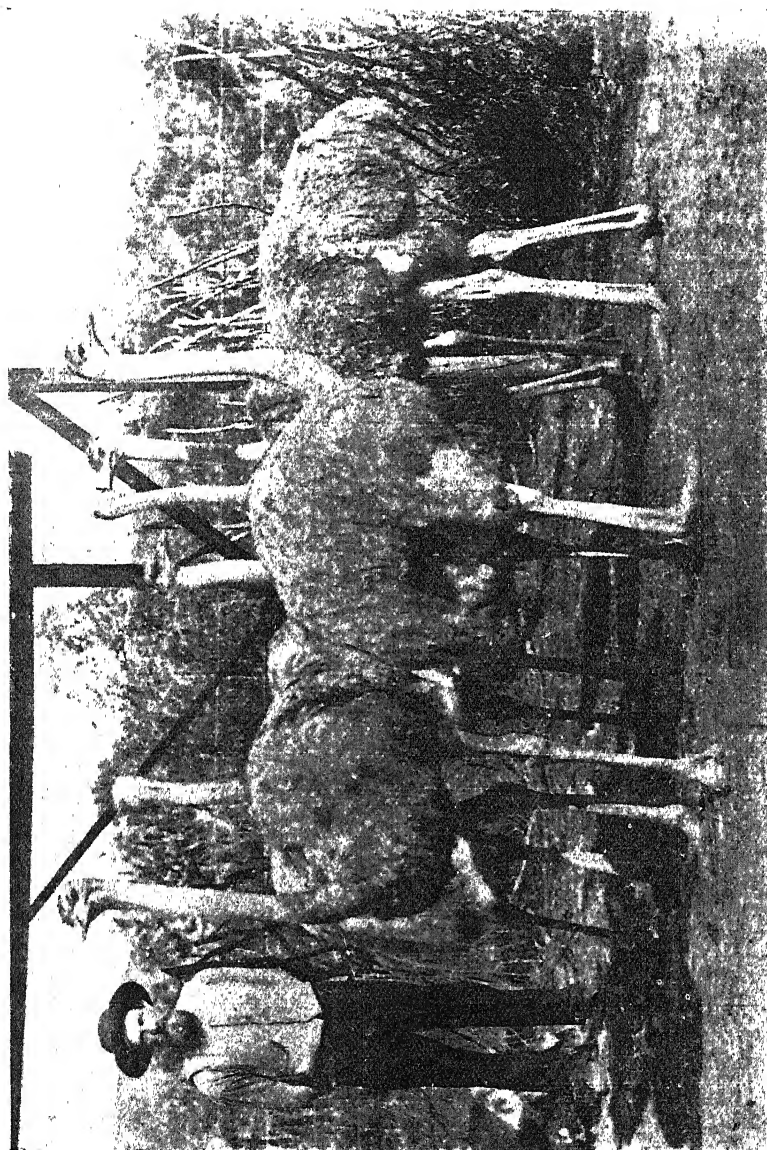
The pages of the *Cape Agricultural Journal* have contained references from time to time with regard to the use of Marram grass for fixing drift sands. One of the localities where the planting of Marram grass has been most successful is Warnambool in Victoria. Here the drift sands have been successfully and permanently fixed, and grass and seed are being distributed from there to other parts of Australia. In the *Agricultural Journal* for March, 1906, is given an account of the successful planting of Marram grass by an Australian farmer who bought up a tract of barren sandy coast and turned it into good pasture with Marram grass. The Forest Department has now a considerable quantity of propagated seed in stock which is available for distribution to farmers. The seed is offered at the rate of 1s. per lb, and it can be obtained on

application to the Conservator of Forests, Cape Town. Marram grass can be grown either from roots or from seed. Roots are the more certain method where they can be obtained without too heavy a cost for transport. There is, however, no difficulty in raising Marram grass from seed. All that is required is a piece of dampish, sandy ground in a sheltered locality. It is somewhat remarkable that Marram grass, which in its adult state can withstand any wind, and which grows the better the stronger the sand blows on to it, is delicate when young, and requires to be in a locality sheltered from drifting sand. Marram grass seed may be sown at any time during the Winter in the nursery, and the young plants are available for planting out one or two years afterwards.

White Ostriches at Dunbrody.

Some months ago a correspondent wrote mentioning that he had some "white ostriches." The letter does not seem to have attracted very much attention, so it may be accepted that birds of this description are seldom met with. But the subject was not forgotten, and in the course of moving about the Colony, we have made several enquiries with the object of eliciting further information. The only birds approaching this description that we have come across were a small flock on the Dunbrody Mission Station, on the Sundays River. The Mission is conducted by the Jesuit Fathers, who combine farming work with their religious and educational practices. Among the agricultural practices, they include ostrich farming on a fairly large scale, and net a fair annual income from that source. The so-called "white ostriches" are among these Dunbrody flocks, and while passing through, some little while back we had an opportunity of inspecting them.

The farm work at Dunbrody is under the charge of an experienced Colonial member of the order, known far and near on the Sundays River as "Brother John." He it was who directed our attention to the birds in question, and on going through them, we found them to be very similar to the description given by our original correspondent. All the birds, males as well as females, carry a plumage of a light grey, where the usual "blacks" would be expected. And "Brother John" thinks the tendency is to breed in that direction. To all outward appearances these birds seemed to show no difference from the others, except that, on close examination, their eyes were found to be a light pink in colour. When this was ascertained, the mystery was believed to be solved, and the so-called "white ostriches" set down as albinos—a not uncommon freak in many animals. The Rev. Father Lallemand, in charge of Dunbrody, kindly forwarded the photograph from which the accompanying illustration is reproduced.



The so-called "White Ostriches" at Dunbrody.

Imported Australian Sheep.

By the *s.s. Carpentaria*, which arrived in Table Bay about the middle of the month, Sir John Frost landed some imported Australian sheep for his son, Mr. F. E. Frost, who is farming at Essex, near Queenstown. The original shipment was a ram and seven ewes from the noted Widgiewa flock, N.S.W. But on arrival it was found that a couple of the ewes had succumbed on the voyage. The ram, however, was landed in good condition, and most of the five ewes brought ashore were very fair. The Widgiewa flock is one of those which have come to the front of late in Australia, the owner, Mr. J. S. Horsfall, having taken a great interest in the recent forward movement there. Though nominally of Australian type, there is Vermont blood in them. The ram, which is described as one of the grandest sheep that ever left Widgiewa, is about two years and five months old, and is well grown. When landed he carried just over 13 months' wool, the fleece being both even and dense over the whole carcase. He should certainly make a mark in this country.

This ram has done well in Australia, having been entered at the Sydney Show in July, 1905, in a class for rams under two years. They were not judged that year, but all were publicly shorn with machines, and handed back to their owners to do as they liked with them. All of them turned up again in Sydney this year, and though all the others had been housed and this one grass-fed, none of them could beat him. The ewes are all 15 months old, and were selected from the stud stock to accompany the ram. Writing of these sheep gives us an opportunity to correct a misunderstanding. At the end of May Mr. F. E. Frost received a consignment of imported sheep from the same flock, and as his brother, Mr. A. H. Frost, of Tarkastad, came down to receive them, we made the mistake of crediting the latter with the importation.

Paspalum Dilatatum—Its History and Origin.

Paspalum Dilatatum is attracting so much attention in South Africa just now, that the following particulars, extracted from the *Kew Bulletin*, should prove interesting reading to many.—*Paspalum Dilatatum*, Poir., commonly known as "Hairy-flowered Paspalum," "Large Water-grass," and in Victoria (Australia) as "Leichardt Grass," and again as "Golden Crown Grass," is indigenous in Brazil, Uruguay, and the Argentine Republic. According to Doell (*Flora Brasiliensis*) the plant has also been collected in Chili, but it is improbable that it is native on that side of the Andes. It is widely distributed in the Gulf States of North

America, and is said to be one of the commonest species in the prairie region of Louisiana. It is found along ditch-sides and in other wet places in Tennessee and the littoral States from South-eastern Virginia to Florida, and westwards to Texas. Throughout this region, in which it is probably naturalised, it is a highly valued fodder-plant, and is widely planted in favourable situations.

Introduced into Australia by Baron F. von Mueller, its cultivation was commenced in the Richmond River district, New South Wales, in 1892. Thence it has spread to Queensland, Victoria and Western Australia, and is now regarded as one of the best fodder-grasses in the country. From the Wollongbar Experimental Farm (Richmond River) seeds were sent to India, and the grass has been grown, with but moderate success, in the fuel and fodder reserves at Nagpur, though it promises to do well in the plains of the Central Provinces. The Agricultural and Horticultural Society of India report (*Annual Report, 1900*) that it grows vigorously at Mussoorie, in spite of "intense cold." The roots of a clump grown there measured over $3\frac{1}{2}$ feet in length. In the *Annual Report* of the Superintendent of the Royal Botanic Garden, Calcutta, for 1900-1901, occurs the following statement:—"The use as a fodder-grass of *Paspalum dilatatum*, a native of America, which has proved very valuable in Australia, owing to its drought-resisting qualities, has led to its introduction to India on as large a scale as possible. Finding that very little seed could be spared by Australian correspondents of the Garden, the assistance of the Agrostologist to the Department of Agriculture of the United States was invoked. Thanks to the kind help of that officer, a large supply of the seed of this grass was obtained from America, and has been freely distributed throughout India."

The attention of South African agriculturists has recently been directed to the valuable properties of *Paspalum dilatatum* as a fodder-grass. A few plants were found at Newcastle (Natal) by Mr. J. Medley Wood in 1897, though when, or through what channel, introduced is not known. It is now found to be fairly abundant in the neighbourhood of Newcastle, and, in all probability, numerous patches occur in various parts of the Colony. In New Zealand it has been in cultivation since 1896, at the Momohaki Experimental Station, where it has produced a yield of grass equal to $9\frac{1}{2}$ tons an acre. It is, however, killed by the cold of the New Zealand winter. The plant is found, also, as a weed or escape, in Porto Rico, Mauritius, and the Straits Settlements.

This grass is a coarse leafy perennial, with a tendency to grow

in clumps; it attains a height of two feet and over—in favourable situations even reaching six feet. It thrives best upon rich moist land, and grows very luxuriantly in black alluvial soils. It is said to succeed also in sandy soils, even when a considerable proportion of salt is present. Being a very deep-rooted grass it has a remarkable capacity for withstanding conditions of drought. In Western Australia it flourishes in poor mountain soils. When once established it withstands frosts, if not continuous, and in Victoria, is successfully cultivated up to an elevation of 2,000 feet. It is, in fact, admirably suited for cultivation in tropical and sub-tropical climates.

As Permanent Pasture.

As a permanent pasture grass, *Paspalum dilatatum* holds a high position among tropical grasses. Notwithstanding its luxuriant habit, its tissues are soft and succulent, and contain only a normal proportion of woody cells. There is “no part of it, from the crown to the head, that stock will not eat.” When well-established it endures long periods of drought without injury. It starts its new growth early in the spring, and continues to grow vigorously until late autumn. It thus affords excellent late summer and autumn feed. Its permanence on suitable soil is undoubted, for at Wollongbar, after four years’ grazing, “the paddocks are still improving, and giving an increased quantity of feed.” (H. M. Williams, in *N.S.W. Agricultural Gazette*, 1898). Excellent results are obtained by using *Paspalum dilatatum* as a constituent of a mixed pasture, which contains also Cocksfoot (*Dactylis glomerata*) or other grass which makes growth in the winter, at which time the *Paspalum* is at its worst. The pasture should be allowed to seed during the second year, that the *Paspalum* may distribute its seed, as it spreads very slowly from the roots. For dairying purposes, *Paspalum* is of great value, as it has great milk-producing properties.

As Hay.

For hay, this grass is rather coarse, and usually has a bad colour when dry. It is, however, of excellent quality, and the yield is very large. A sample grown on the Wollongbar Experimental Farm gave the following results on analysis (F. B. Guthrie, in *N.S.W. Agricultural Gazette*, 1897 :—

Moisture	...	10.55		
Albuminoids	...	10.31	{ soluble	... 1.38
			{ insoluble	... 8.98
Digestible fibre	...	29.96		
Woody fibre	...	27.95		
Ash	...	6.37	{ soluble	... 4.32
			{ insoluble	... 2.05
Amide compounds	...	14.86	{ total nitrogen	... 2.66
Chlorophyll, etc.	...		{ amide nitrogen	... 1.01
		<hr/>		
		100.00		

This analysis compares very favourably with that of ordinary English hay, and shews a larger proportion of digestible and nourishing material. In deeply worked rich soils at least three crops may be obtained per annum when the plant is well established. On the Richmond River (N.S.W.) Government Farm, in one year, 14 tons per acre were obtained on the first cutting, 8 to 10 on the second, after which a third crop of 6 to 7 tons was gathered, making a total yield of 28 to 31 tons per acre.

An analysis of a sample of the crop grown on good cultivated land on the creek flats of the Queensland Agricultural College, and cut on April 22nd, 1901, compares rather unfavourably with the foregoing. The yield of grass in this crop was 10.525 tons per acre, and of hay (air-dried grass), 2.858 tons per acre. The analysis of the hay yielded the following figures (J. C. Brünnich, F.C.S., in *Queensland Agricultural Journal*, 1901, pp. 245, 246):—

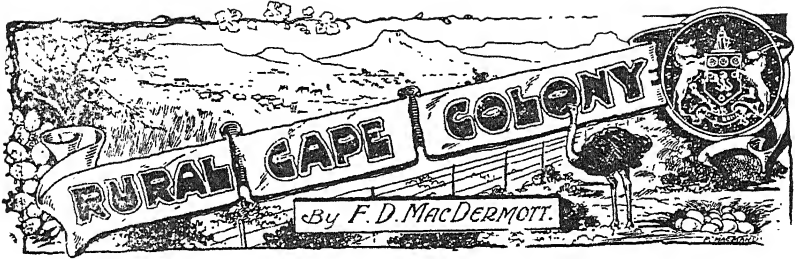
Moisture	...	10.72			
Albuminoids	...	4.81	{	soluble	... 0.96
				insoluble	... 3.85
Digestible fibre	...	26.97			
Woody fibre	...	34.45			
Ash	...	10.14	{	soluble	... 6.06
				insoluble	... 4.08
Amide compounds	...	12.91	{	total nitrogen	... 0.882
Chlorophyll, fat, etc.	...			amide nitrogen	... 0.112
		<hr/>			
		100.00			

There is a remarkable difference in nitrogen yield between this sample and that analysed by Mr. Guthrie. The apparent inferiority of this crop is attributed by Mr. Brünnich to the facts that the grass was over-ripe when cut, and had been grown in exceptionally dry weather, and on a larger scale than the Wollongbar sample.

Seeds and Sowing.

From the time that the first seeds in each spike are mature, the ripening of the whole spike occupies about three weeks. In consequence, the harvesting of the seeds is a matter of some difficulty. Those collected during the first few days of ripening are of better quality than those shed later, for a much larger proportion of them are mature, and will germinate. To produce a good pasture on well-prepared land, 5 to 8 lbs. of seed per acre is recommended as being sufficient. The plant should be allowed to shed its seed until the growth is established. The best time for sowing is in the beginning of the warm season, just before the rains are expected. Under favourable conditions the seeds germinate in 18 to 21 days. For quick results, and also on account of the difficulty of obtaining reliable seed, the planting of "roots" is recommended, particularly when a mixed pasture is being formed. At Wollongbar the "roots" are planted 4 or 5 feet apart, each way, and the ordinary grass or clover seeds are afterwards sown in their proper seasons.

The International Stock Food Company are distributing pamphlets and other literature free on application giving details of many of the ordinary sicknesses that attack stock and poultry. Applications should be addressed to Mr. A. Dixon, 26, Hout Street Cape Town,



NO. XXI. (Continued from page 330.)

THE DISTRICT OF BEDFORD.

Last month I gave some details of the Mancazana Valley and some of its more prominent features but was compelled by demands on space to defer some further notes I had on a few other properties I visited there. Among these was a really fine farm belonging to Mr. J. Bennett, named

“ANSTREY.”

This property lies in one of the valleys leading from the Mancazana proper towards the lower slopes of the Winterberg and commands many advantages. Mixed farming is followed here in very complete form and a large extent of arable land in the valley bottom is laid down to cereal crops. Cattle thrive well all through these upland valleys, and the Afrikander is the favourite, being used largely even for dairying purposes. Although some distance from the creameries, these farms send down large supplies very regularly, and as they develop more on this side they will hold a very strong position on account of the large quantities of fodder they will be able to produce. At present the crops are largely marketed but with the growing demand for dairy and animal products generally it should pay better before very long to send the bulk of them off the farm in this form. Very heavy crops of mealies can be grown here and once the full feeding value of that splendid cereal is appreciated it will not take these progressive farmers long to see the advantage of turning their energies more and more to the raising of stock. Even now one hears of the introduction of machinery like the mealie shredder

into the adjoining district of Fort Beaufort where Mr. Llewellyn Roberts has demonstrated its uses for the preparation of fodder. The whole of these Eastern sections must soon be following suit for there is little reason why the homely mealie should not play as important a part there in the feeding and fattening of stock as it has in the great "Corn Belt," of the United States. This is looking ahead, but not so far forward as some may imagine; for on every side all through the Eastern Province, signs of activity in the direction of better and more systematic methods of stock raising are apparent. Improved methods are slow to take hold in this Colony but once they get a firm grip soon spread—particularly when there is money in them.

A property like "Anstrey" with its wide stretch of arable lands could soon be made adaptable for development in this direction. It is not such a very great stride either, for there is every desire on the part of the young proprietor to advance. Substantial stone buildings abound and the whole place is permeated with an atmosphere of solidity and substance. It would need very little more than a definite policy, in fact, to bring the stock side uppermost—with a full range of barns and byres on the large scale.

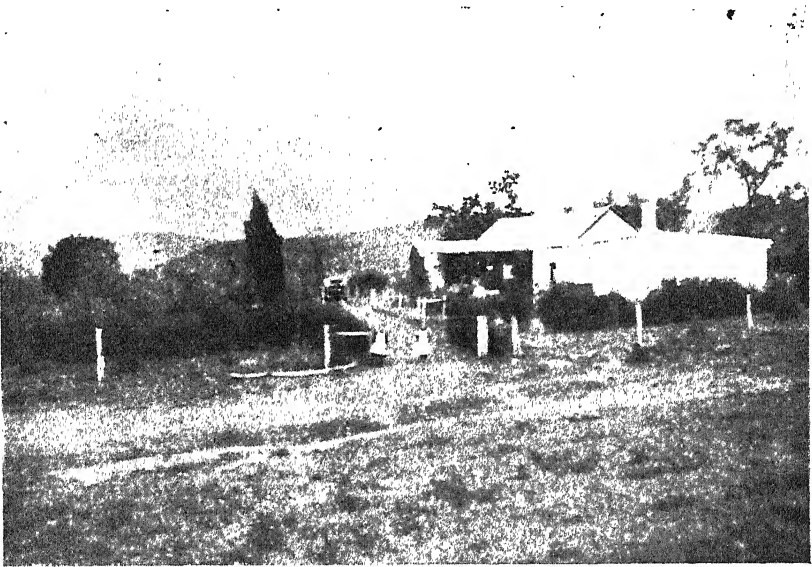
Woolled sheep are another of the staple products of the farm which thrive apace. The shearing is done in one of the larger stone built barns which makes an excellent shearing house and at the same time allows the clip to be handled with sufficient care. Even the machine-shear has managed to intrude its labour-saving virtues into this far-off corner and in time promises to establish itself permanently. The type of sheep favoured here is largely that met with in other parts of the district—namely, the Rambouillet—and as it seems to suit the local conditions, is probably the best for general purposes.

Water is not over-plentiful but there is sufficient from permanent sources on the farm to bring a fair proportion of the arable land under irrigation. Water mills are common on the older properties in this district and "Anstrey" is no exception. But the water has been displaced here, except in times of plenty, and steam has been introduced in its stead for power purposes—the water being found more valuable for the general purposes of the farm.

Though fruit-growing on a commercial scale has yet to be adopted as a permanent industry, there is no lack of effort in orcharding. Among the more successful of the fruit trees planted here is the Smyrna fig, which, I was assured, fruits well and gives good crops while on adjoining properties it is quite a failure. Citrus fruits are being planted and with care should prove a success, while apples, plums and other fruits are coming on very well indeed in a well-laid out orchard close to the picturesque homestead.

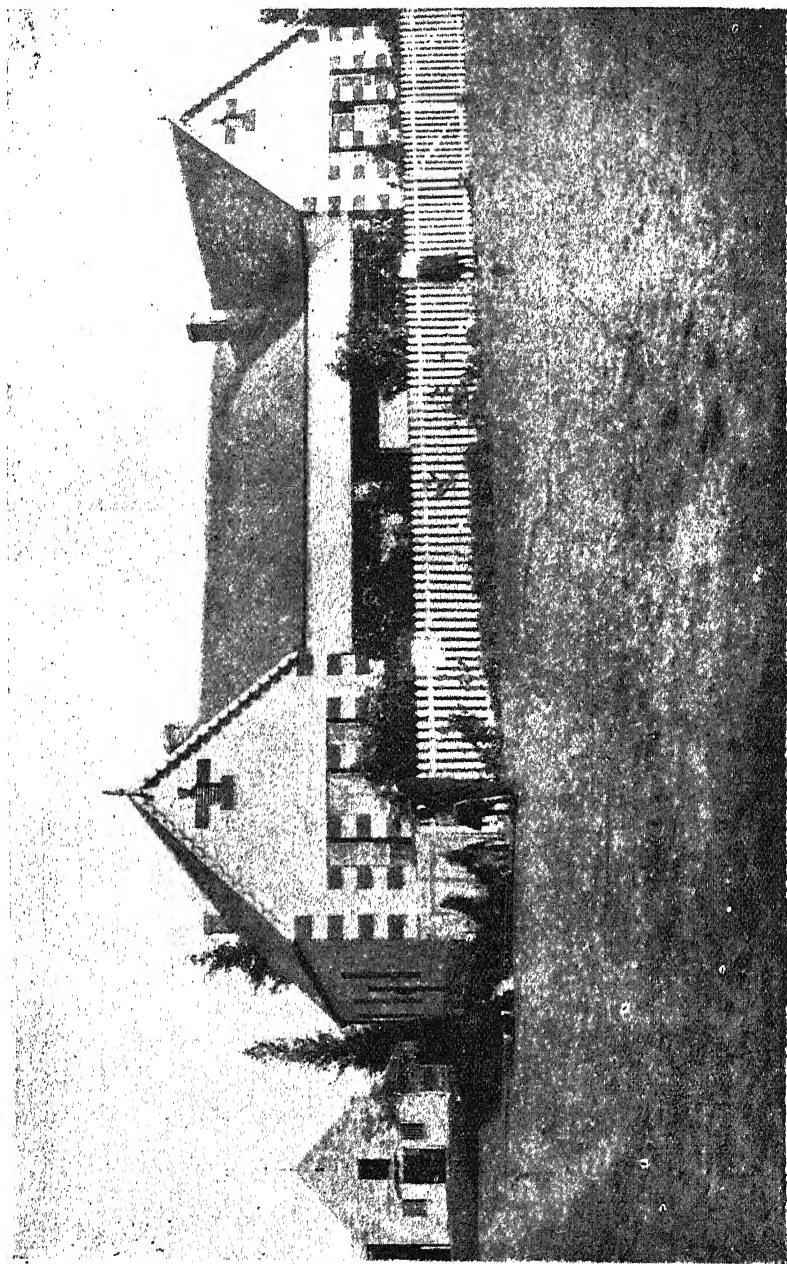
“WHITEBANK ” AND “MILLNESS.”

“Whitebank” lies in the upper part of Mancazana Valley proper, and is wedged in between steep ranges well above the level of the Pringle properties “Thorndale” and “Glen Thorn.” It is owned by the Messrs. E. J. and H. A. Morgan and includes a goodly stretch of arable land in the valley served by the river waters. Heavy cereal crops are produced here also but the general appearance of the country is steep and bare, and the soil on the upper slopes is rather thin, while the veld is sour. Well above this in another valley leading up towards the foothills of the Winterberg are the properties of the two brothers Pearson, “Lower



“Upper Millness” in the Mancazana, the property of Mr. W. Pearson.

Millness” and “Upper Millness.” These are both well situated but have not the attractive appearance of the homesteads in the lower parts of the valley mainly owing to the absence of natural timber. Efforts are being made, however, to make up this deficiency, but owing to the higher elevation and the conditions of the soil, tree-planting is a hard task. Mr. C. Pearson of “Lower Millness,” has done a great deal in this direction with fair results, the most promising trees he has planted being cypresses. The homestead is a modern brick building well-finished off and, in close proximity, a neat, well kept orchard, with a goodly array of young citrus trees, forms quite an attractive feature of the otherwise rather bleak landscape. The veld, though sour, provides excellent



"Primestone," the homestead of Mr. E. G. King.

grazing for cattle, and sheep do wonderfully well. At "Upper Millness" where Mr. W. Pearson lives, some miles higher up the valley, the conditions are much the same. Here I saw a couple of the latest importations in the shape of rams selected at the National Stud Farm at Rambouillet (France) by Mr. Pearson during a recent visit to Europe. They were an excellent type of animal and are bound to do well as they are well cared for. The winter in these hills must be fairly severe, judging from samples of the weather while I was there.

After my hurried visit to these more mountainous parts of the district the comparatively level plains nearer Bedford were very welcome and I was not sorry when I reached

"PRIMESTONE," THE HOMESTEAD OF MR. EDWARD G. KING

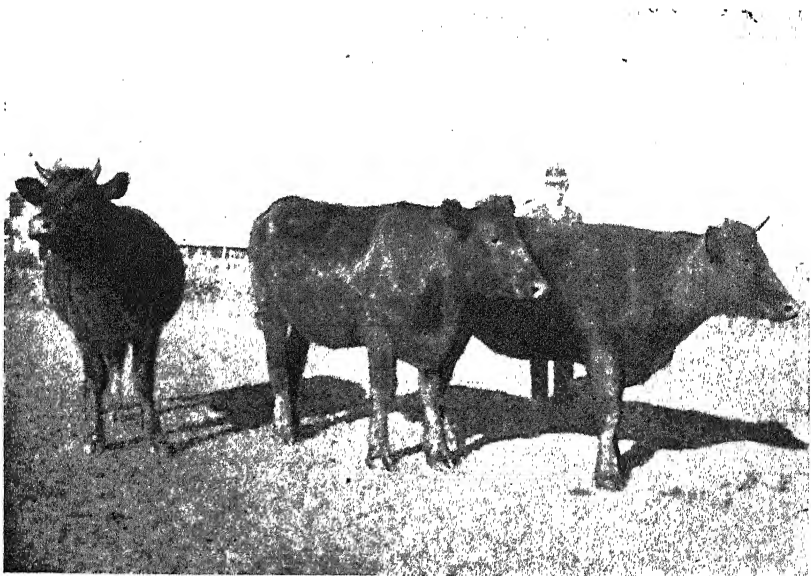
after a rapid cart journey from the upper end of the Manzana before lunch. The firm of Geo. King and Sons is so well known throughout the Eastern Province that there is very little need to explain who they are to farmer readers in that part of the Colony. At every Agricultural Show of any importance their name figures prominently not only in the catalogues but also among the prize winners, and for many years past they have maintained a high reputation for well-bred stock of every description. "The firm" was established by the father of the present generation, the late Mr. Geo. King; now it comprises four distinct farming concerns conducted by the four brothers but still working together. Of these, two are in the Bedford District, the others being in Tarkastad. "Primestone" is one of the best known farms in Bedford, but the original home of this family is "Elizabeth," now conducted by Mr. Wilby King, a few miles nearer town. At "Primestone" I spent an instructive and interesting afternoon and was genuinely sorry that I could not stay longer. The greater part of this property lies on the more level lands close to the railway and not far from the Cowey river. Mixed farming is carried on, but stock is the main interest. The homestead is a substantial modern dwelling surrounded by the farm buildings and looks out over a fine extent of arable land mostly laid down to lucerne. This part of the farm is excellently situated for irrigation and, were there more water available, could undoubtedly be made to produce enormous quantities of fodder. But, unfortunately, the water has not been so plentiful as could be wished during recent seasons owing to the persistent droughts. With a view to remedying this state of affairs Mr. King is now proceeding with the construction of a large dam on the upper part of the farm into which he will be able to lead some of the flood waters of the Cowey River. When completed this dam will bring under irrigation a further stretch of land for lucerne which is now being cleared and prepared in advance. With these improvements,

the capacities of this fine property will be greatly increased and its stock-carrying possibilities should be more than doubled.

The main feature of "Prinestone" as I saw it was the cattle. The King herd of pure Shorthorns has enjoyed a well-earned reputation for many years past, and there is every sign that in the future that reputation will be enhanced. With these notes a few snapshots of some of these fine cattle are reproduced, and as the photographs were taken at haphazard just as the herd was driven into the kraals in the evening—when the light was not too good—it is to be feared they are not over flattering. It has to be remembered that though representatives of the King herds so frequently figure as prize winners at Shows the cattle themselves are not kept in any sense "for show purposes only." The heavy shipments of live stock continuously sent away by rail from Prinestone Station will shew that the cattle are bred for general utility as well as show, while the large dairy herd—some 200 strong—in continuous profit speaks for itself. The ambition of these breeders—a tradition handed down from their father, the late Mr. Geo. King—has been, for years past, to create herds of Colonial Shorthorns that will hold their own in open competition from any quarter and though they may not have succeeded as yet in producing anything to compare with the best of those imported, there is no reason why they should not, in time, establish a strain of great value to this part of the colony. The efforts to maintain and improve the quality of the herd are continuous. The former is secured by careful selection, the latter by the importation of new blood at regular intervals. The latest importation is "Sirdar," a bull now about five years old, of excellent quality and breed. To reach the heights of the ambition aimed at, these breeders will now have to turn their attention in the same direction as the breeders of high class stud cattle in other countries, and see if they cannot by careful mating, selection and feeding, produce an animal to hold its own with the best in the world. It may look like a counsel of perfection and beyond the practical scope of the cattle raiser in a colony like this. But when the whole case is carefully examined from every point of view, such an ambition is not only laudable, but likely to give sound business results. No one who takes the trouble to look into the conditions of this colony on the agricultural side can help seeing that the future must lie in stock-farming. As stock-farming advances the demand for high-class stock must increase; and as the demand grows the standard of quality will rise accordingly, therefore now is the time to found the herds whose progeny will command high prices in the future. The conditions for rearing cattle of the finest quality are present here; it only needs energy, enterprise and faith in the future to secure the rest. If Mr. O. E. G. Evans and other breeders of high-class ostriches can command the high prices they do to-day after a comparatively short experience with this class of stock, there should be plenty of room for the cattle breeder



Shorthorn Milkers at "Primestone."



Shorthorn Heifers at "Primestone."



More Shorthorn Youngsters at "Primestone."

with all the experience of other countries to draw upon to do equally well in his own particular line. The direct return will not come in a generation; but sustained effort along the right lines should certainly bring it in time and that much earlier than many people imagine. We are often told that agriculture is the one permanent industry the country has to rely upon; and in that industry the most profitable branch must be stock-farming because our conditions are most suited to it.

Among the other activities most prominent at "Primestone" that of horse-breeding also takes a part. The Kings are as well-known for an excellent stamp of useful horse as for their cattle. With this is shewn a reproduction of a pair of young buggy horses that rattled us down from Blackhill in the Mancazana to Primestone in a couple of hours without turning a hair, having been driven up there the same morning by Mr. E. G. King in order to meet me. This is the stamp of horse that is wanted in the Colony and always commands a good price, but is not always obtainable. Like other horse-breeders in these parts, however, Mr. King regrets the dearth of good colonial mares caused by the exigencies and troubles of the war. But they are getting a good start again and before many seasons pass should, with ordinary luck, be putting out something equal to the best in the past.

Merino sheep and Angoras are also included in the scope of this firm, but I had not the pleasure of seeing much of the small stock on this trip, as they were mostly on the other farms.

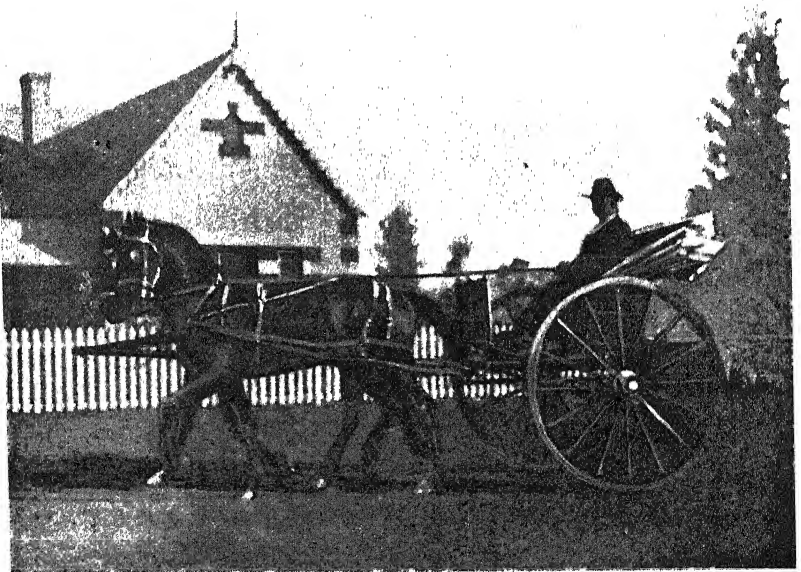
Like most of the leading farmers in this section "the garden" includes fruit of various kinds, and most seem to do fairly well, but there is no orcharding on the large scale. However, what there is is kept clean and healthy and thrives well. There is plenty of tree planting going on, but it is mostly for shelter and ornament as the indigenous trees are nearly all acacias (of the "Mimosa" or thorn type). So far Cypresses of various kinds seem to do well, and these make a very fine show at "Primestone," especially in the avenue leading up to the house. Among other trees Mr. King has planted a goodly array of

CAROBS OR LOCUST BEAN TREES

which he recommends strongly as most suitable to these parts. He raised these trees some years ago from seeds distributed by the Agricultural Department, and has been fortunate with them, for he gets large crops of the beans every year and stock of all kinds are very fond of them. As a stand-by in time of scarcity they are invaluable, and as they seem to thrive so well in this district it is somewhat surprising that they have not been more generally planted. The only care they seem to need is to keep stock off them. In this case they are grown inside the fences enclosing the arable land.



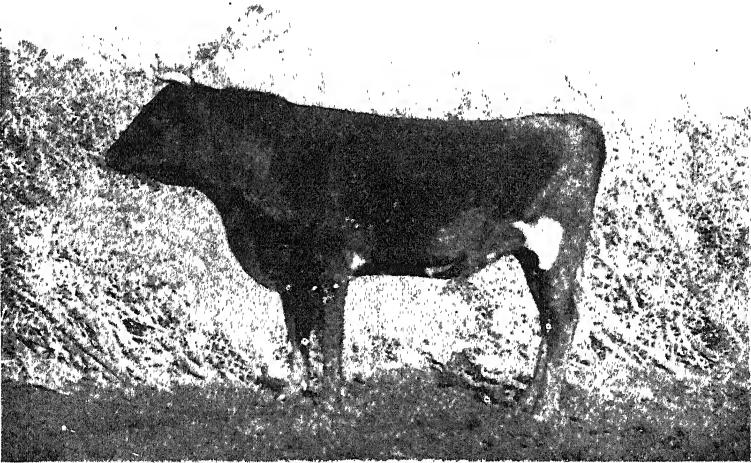
Young Buggy Horses bred at "Primestone."



Young Buggy Horses taken at full trot.

THE FARM "ELIZABETH."

While in the neighbourhood I was driven over to "Elizabeth," the original home of the King family, and there saw yet more and more of the King herd of Shorthorns. Here I had the pleasure of renewing an old friendship. I have often admired that grand old horse "Moscow" when year after year he has competed in the jumping competitions at Eastern shows, and never yet been beaten. At "Elizabeth" I had the pleasure of finding him at home and looking as well and fit as ever. It only needed the suggestion and Mr. Wilby King promptly had him led out and



Young Shorthorn Bull at "Elizabeth," 1st prize at last East London Show.

saddled. The jumping hurdle was set up and in about the same time as it takes me to write it down he was gaily taking it in his stride, while I snapped him as he crossed the bar. "Moscow" is not only a notable horse for his feats in public but he is also a horse with a history. He is now well on in years and in his time has played many parts. Not the least notable of these was the part he took in the late war. When Commandant Kritzinger descended on the Colony he was fortunate enough to secure this splendid animal among his other prizes, and at once appropriated him as his charger. He kept him till the close of hostilities, and if the old horse could speak he could doubtless tell many stories of adventure that would make interesting reading.

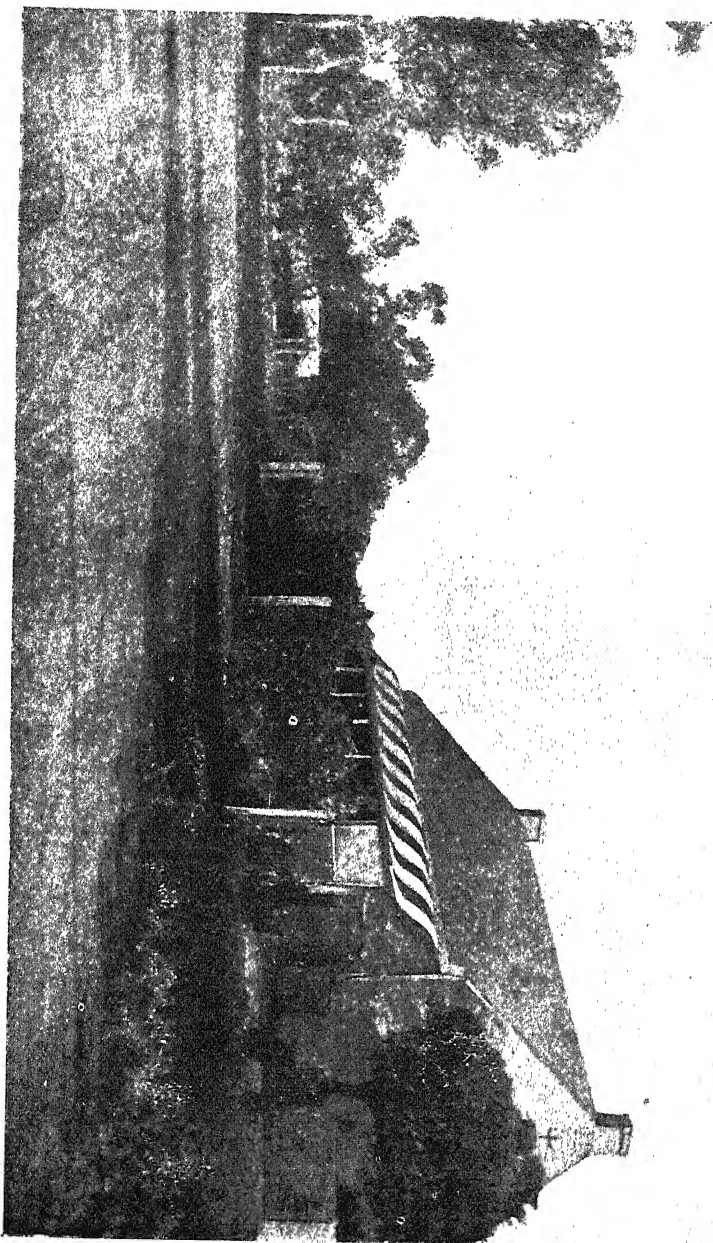
"Elizabeth" has an old-world air about it, and is more Colonial in appearance than "Primestone." The property is fairly well sheltered with massive bluegums and other trees, and is in many respects more picturesque than most of the farms on the flats hereabouts. But the farming is up-to-date. Wherever possible, lucerne is grown under irrigation, and the stock are kept in admirable condition.

While here Mr. Wilby King was kind enough to drive me a few miles down the Kaga, when we called at "Prospect," the farm of Mr. Leonard (of the firm of Leonard & Painter), a nicely situated property, with a promising orchard laid out in the lower part. I here saw some good quality imported Tasmanian rams, the property of Mr. L. Mackay, of Port Elizabeth, who has started farming on an adjoining property. Mr. Mackay evidently intends going in for horse breeding as well, for he bought the well-known Colonial-bred Hackney "Adjutant II" at the last Port Elizabeth Show. In the distance we saw "Herbert's Hope," the property of Mr. Henry Cloete, but as time was pressing I had to return in order to be in time to catch my train.

FENCING AND GATES.

I cannot leave my notes on this district unfinished without again offering a few remarks on the general excellence of the fencing. In most parts it is good and in many admirable. In fact it is doubtful if any other district in the Colony is better or more systematically fenced. Take the properties of the Kings, in addition to those I have mentioned previously. Although of wide extent, they are splendidly paddocked off, while miles and miles of jackal-proof netting have been erected. The gates, too, are also a feature of the district. It has often been said that a farmer may be judged by his gates—in that case the average Bedford farmer may be given a high character. Even in the out-of-the-way spots I visited in the Mancazana, woven wire fences were common, and substantial iron gates erected wherever necessary. The only trouble seems to be that capital is not available to continue the netting of whole blocks of farms. But this, it is hoped, will be remedied by the introduction of the co-operative system under the Government scheme.

It may seem to readers of these notes that I must have seen a good deal of the district of Bedford during my hurried visit, but, from all I could hear, there is a great deal more that I did not see, and I left with regret, for I am firmly convinced that these sketchy notes do but scant justice to so promising and thriving a section of the Colony. Some day I hope to be able to make amends by visiting those parts of the district I was compelled to overlook on this trip and devoting a little more time and a few more pages to its agricultural and pastoral progress and advancement.



“Elizabeth,” the old Homestead of the King Family.



.. Moscow.. clearing a hurdle.



A young "Moscow."



.. Moscow " as he is.

THE ORGANISATION OF AGRICULTURAL ASSOCIATIONS.

By P. J. Du TORT.

At the last Congress of Fruit and Vine Growers, resolutions were passed in favour of free postage on letters and agricultural literature despatched by Associations and grants on the £ for £ principle for the purchase of agricultural books.

Taking it for granted that every Association spends or intends to spend its means profitably, the request by Agricultural Associations (using the term in its widest sense) for monetary aid is in itself a good symptom: the desire for funds is as satisfactory a sign of vigour as is a good appetite in the case of the human being. It is, obvious, however, that the manner of obtaining the necessary sustenance has an important bearing on the well-being of the individual.

It is this phase of the subject which it is intended to pursue without seeking to discuss the broad question, in what circumstances it is desirable to receive gifts at all.

Presumably our Farmers' Associations, Fruit Growers' Associations and Agricultural Societies are not all thoroughly acquainted with the constitution of the 108 bodies which in their own spheres do laudable work under one or other of these names. If so, it is as well to say here that they vary in membership from 8 to 460; in scope with the needs peculiar to the localities they respectively serve; and in activity,—(no invidious comparison is intended)—with membership and funds more or less. Supposing that the Government are able to set aside some £5,000 for the purposes mentioned in the resolutions, consider how that amount is to be apportioned. Is it to be according to membership, or according to subscriptions, or according to attendance of members at meetings, or according to the number of meetings held per year, or according to the area over which influence is exerted, or according to what other bases or combination of them? It might be said that the difficulty here put forward is not serious, and that Government aid might be granted in proportion to local contributions. But such a view would be fundamentally wrong, because the granting of aid implies a need; and the greater the need, the greater the aid required; that is, the aid should be in inverse proportion to the funds Associations are able to raise locally, provided other circumstances are equal. It is not a question of purchase and sale, in which acquisition accords with

expenditure (or ought to) ; in other words, it is not a question of an Association purchasing assistance from the Government according to the Association's means : what is asked of the Government is a

The matter of obtaining funds in the form indicated is beset with difficulties, and it appears to have arisen from a radical misconception. Agricultural Associations do valuable work in discussing farming matters and interchanging experiences and views ; but it is rarely that they exercise executive functions for the benefit of the general public, in which capacity alone they could justifiably ask for monetary aid from the Government. Agricultural Societies, in so far as they conduct Shows, are executive branches of the Agricultural Department, and as such receive Government grants ; but Farmers' Associations and Fruit Growers' Associations, if only discussing the various problems associated with their spheres of labour, are not executive, but advisory ; they are not branches, but roots. The Agricultural Department looks to them to feed it with local requirements and views, and the better they do so the more vigorous and fruitful will be the Department itself. Hence the desirability of amalgamation as far as possible. But amalgamation aside for the present, one thing seems clear : the activity of Associations would be stimulated if they had more funds ; and they would be best stimulated if such funds were obtained by the efforts of the Associations themselves working along certain lines.

Now, there are several ways in which Agricultural Associations can increase their funds without recourse to the Treasury. The chief method is probably combination for the purchase of farmers' requirements—stock, machinery, implements, tools, fencing materials, seeds, manures, etc. The fact that articles purchased wholesale can generally be obtained at much lower rates than if bought retail is almost too well known to need mention, much less illustration. Yet the results of combination are so far-reaching that there is every excuse for the statement. Combined purchase is a sound beginning. It is a small beginning with good prospects. Of course the obstacles to combination are many and great. The isolation of farmers renders mobility difficult. Yet there are means of combined purchase with immediate gain which are not impracticable. It has been ascertained, for instance, that two of the largest and most reputable firms in Cape Town are prepared to supply artificial manures at prices which are considerable reductions on those which obtain at present. One firm offers a reduction of 25 per cent., and the other quotes prices which are $7\frac{1}{2}$ per cent. higher than those ruling in England. In each case the minimum quantity purchased must be 100 tons, and certain conditions as to delivery and payment must be complied with.

Will Associations consider the practicability of themselves undertaking the agency for members—placing the orders, arranging about payments, and charging a commission to cover expenses and

leave a margin of profit? It may be said that it is not clear where the saving to the farmer comes in, for the work to be performed by the Associations demands expenditure. The saving enters in doing away with cartage from the docks, storing, removing from the store, carting to the railway station, the relative additional cost of despatching small consignments, and in obtaining the lower railway rate for large consignments. The additional cartage and the labour expenses in storing are naturally added by the merchant to the prime cost, and are paid for by the farmer under the present system of purchase.

If this proposal as regards manures could be given effect to with advantage, Associations would be in a position to see to what other farmers' requisites it could be extended.

Another means of increasing the funds of the Associations by means of combined action, and at the same time benefiting members, is the holding of stock fairs, a work which is already conducted by some Associations. The Bedford Farmers' Association, for instance, has for some years past been conducting such fairs on the following lines:—Auctioneers are appointed, their commission being not more than $6\frac{1}{2}$ per cent., 1 per cent. of which must be paid to the Association for advertising, etc. The auctioneers are to pay sellers in cash, and grant buyers three months' credit on approved bills for purchases exceeding £10. Non-members are charged 2s. 6d. entrance fee for bringing stock to the sale. For stock sold but not previously advertised, an additional $2\frac{1}{2}$ per cent. on the proceeds is deducted by the Association. The cost of disinfecting pens occupied by scabby sheep or goats has to be borne by the owner of the stock.

The Paarl Farmers' Association has adopted rules for conducting stock fairs more or less on the lines of the rules of the Bedford Association.

As the funds of the Association increase, other fields of labour would open out, such as awarding prizes for competition with agricultural machinery, competition in fruit-growing, cereal cultivation, egg-production, etc.; appointing their own instructors in fruit-drying, grading and packing for the purpose of securing uniformity of marketing, and in grading produce such as potatoes and eggs for the market; regulating the supply of members' produce so as to maintain prices.

These are problems which are in the power of Agricultural Associations to solve; and for this purpose the assistance and advice of Government officials would be made available as far as possible. The wheels of Government move very slowly, necessarily so; and this in itself is an excellent reason why the moving force should come from the Associations and not from the Government. The excellent example set by the Wellington Fruit Growers' Association last season, in combining to sell their fruit in Cape Town, is an indication of how much beneficial work lies ahead.

CITRUS FAILURES IN PIQUETBERG.

Some years ago Mr. S. W. Burger, of Groen Vallei, Piquetberg, enjoyed an income of something like £700 a year from his orange groves. Then Mal-di-gomma or Collar Rot attacked the trees, and when the Citrus Commission visited the farm a couple of years back, the whole orchard was past recovery. He was then advised to dig the old trees out, destroy them, and re-plant on resistant roots in new ground. He put in 350 new trees, but about four months back he wrote to Mr. P. J. Cillie, of Wellington, as a member of the late Citrus Commission, asking him to go down and advise in regard to the newly planted groves as they were also dying.

Mr. Cillie referred the matter to the Department of Agriculture, and being authorised to visit the farm and advise, did so, the results being contained in the following report submitted subsequently to the Director of Agriculture :—

INVESTIGATIONS *re* THE DYING OF A CITRUS ORCHARD IN THE PIQUETBERG DISTRICT.

SIR,—Acting on the instructions contained in your letter of the 29th June, I visited the farm Groen Vallei, belonging to Mr. S. W. Burger, on the 12th inst. (July) to investigate as to the dying of a young Citrus orchard. The farm, which is about 12 miles from the town of Piquetberg, is the same mentioned in the report of the Citrus Commission under the heading Piquetberg, and was only a few years back famous for both the quantity and quality of the Oranges and Nartjes annually produced. No trace of the old orchards is left except a few mammoth dead stumps, and Mr. Burger was busy at the time of my visit preparing the land to set out a deciduous orchard, for which the ground is of course pre-eminently suitable. The young orchard which is now infected is a seedling orchard of about 350 trees, planted two years ago. The seedling trees were brought from the farm “Korraanshoogte,” Clanwilliam, and were only from 15in. to 18in. high at the time of planting in September, 1904. They have made excellent growth, as many of the trees are standing over 5 feet now, and those not affected by Mal-di-goma are as healthy and vigorous as the best I have ever seen.

Site and Soil.—The soil, which is sandy, is naturally well drained, having a fall of about two to three feet in the hundred, with a sluic of over five feet deep at the lower side of the orchard.

The land, which was virgin soil, and was used as veld, was prepared by double ploughing, and trenches two feet deep and three feet wide, were dug from the top to the sluit, and the trees planted in those trenches. Few of the trees are planted too deep, but as I found dead and affected trees among the shallow, as well as the deep-planted ones, that cannot be the reason of the virulence of the disease.

Irrigation.—The site of the new orchard being such that irrigation water could only be brought to it after passing through the ground where the old orchard succumbed to *mal-di-goma*, Mr. Burger went to considerable expense, and took the water in 5-inch iron pipes from a point above the infected area right to the new orchard, a distance of some hundreds of yards. The implements, such as ploughs, spades, etc., that were used in working the new orchard, were kept separate from those used in working the rest of the farm. In fact, from the information supplied, I think every possible care was taken to safeguard the newly-planted trees against infection from the infected area on the farm.

Supposed Causes of the Disease.—I. The seedling trees, when brought from Clanwilliam, may have been infected by the disease. However, the Clanwilliam district is supposed to be free from *mal-di-goma*, and the trees had no signs of the disease whatsoever in the first year after they were planted. Moreover, if the seedlings were affected on the seed bed, more would certainly have died than are actually dead—about 6 or 7 per cent.—and the others would not have made that healthy, vigorous growth there is to-day. So that this supposition falls to the ground.

II. The disease was brought with kraal manure from the kraals. As during last winter Mr. Burger applied about two bushel buckets of manure to every tree, and that manure was spread round the trunk of the tree and dug in, there is not the least doubt in my mind that this is the sole cause of the trouble. A few reasons that I have for that belief are: (a) I found manure round several of the dead trees in contact with the trunks. (b) The percentage of infected trees is far more amongst the vigorous than the smaller trees. (c) The infection is very evenly spread over the whole orchard. (d) Both the dead and the diseased trees have been affected just round the collar of the tree; that is where they came in contact with the manure.

I have advised Mr. Burger to have the roots opened, and to follow the recommendations of the Citrus Commission in their report, of which he received a copy from your Department. He put his men on to the work at once, and it will be an object-lesson to see what effect the opening of the roots has on such a young orchard so badly infected with *mal-di-goma*.

Several other citrus orchards in the district were visited, and it was most gratifying to see some of the marvellous recoveries from *mal-di-goma* that were made where the instructions and recommen-

dations of the Citrus Commission were followed up. It was certainly a pleasant surprise to me to find so many instances where the advice given had been acted upon with such excellent results.

Red scale, although prevalent in every orchard visited, was not so bad that the trees suffered from its effects. Practically nothing has been done by either spraying or fumigation against scale in the district. As, however, the plantations of orange and naartje trees in the district have considerably increased during the last few years, I think it very desirable that some means should be taken to get the red scale under proper control before it has spread to such an extent that it will be hard to deal with, as the old seedling orchards are so badly intergrown that there will be no possibility of putting sail covers over the trees for fumigation, unless the trees are severely cut back.

P. J. CILLIE, C.SON.

Wellington, July, 1906.

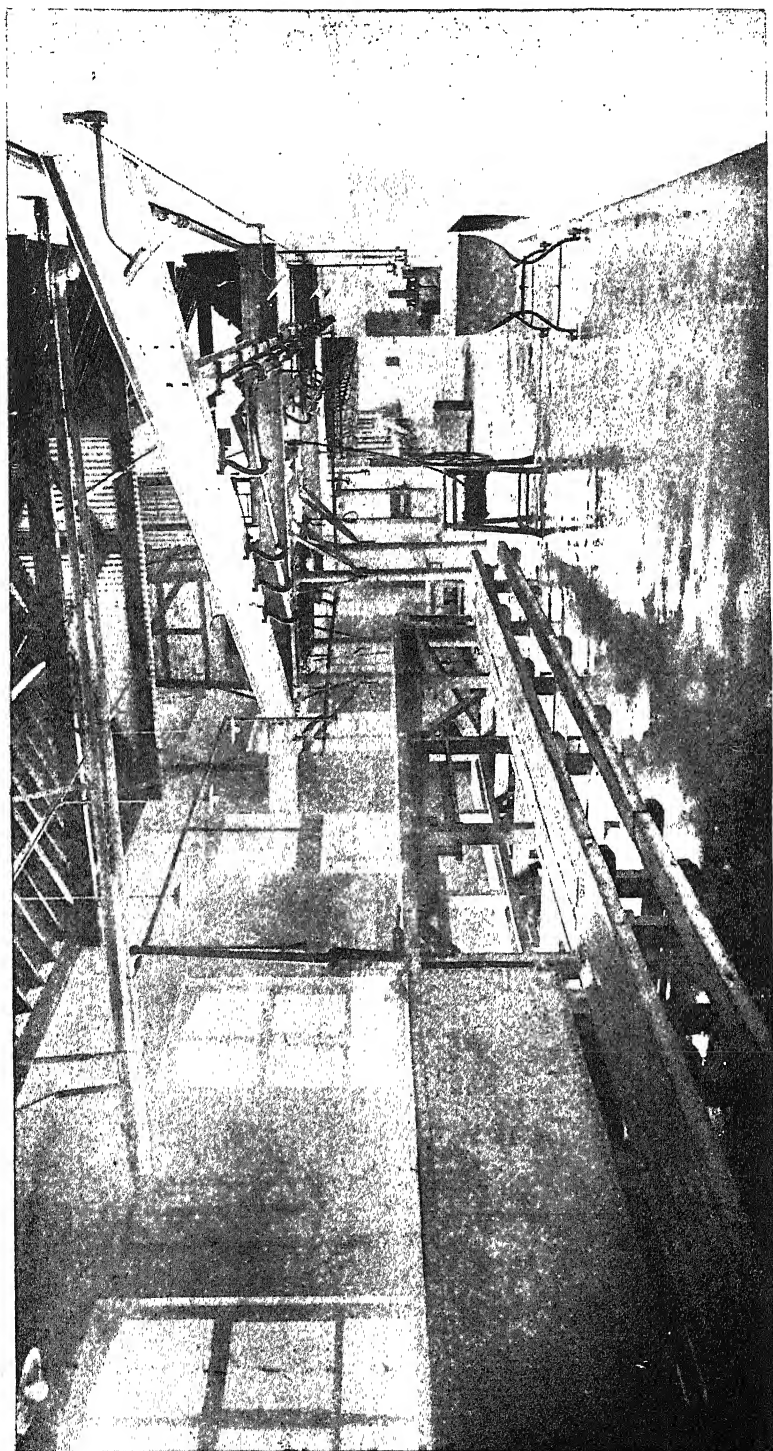
BACON-MAKING IN IRELAND.

THE CO-OPERATIVE WHOLESALE SOCIETY'S BACON FACTORY AT TRALEE, COUNTY KERRY.

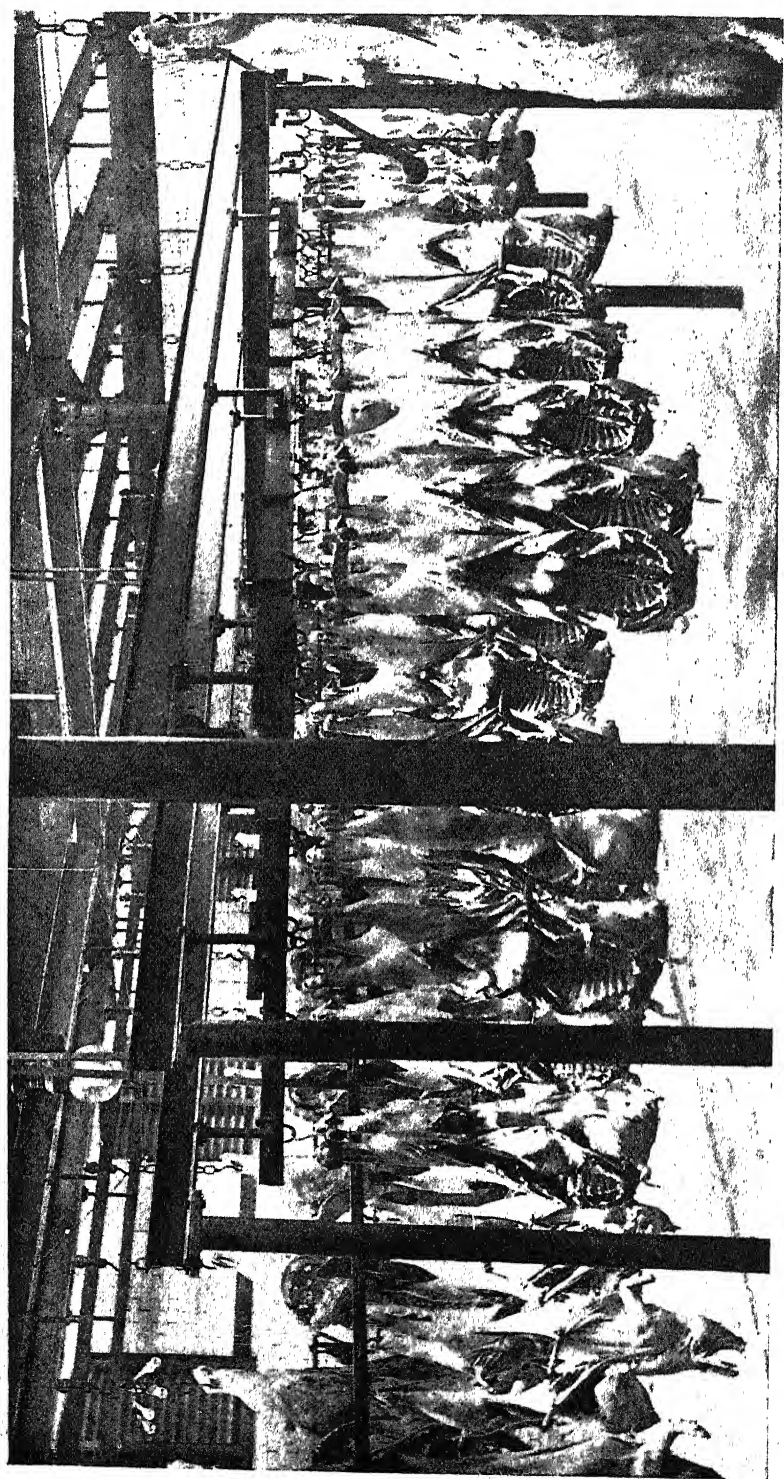
By Mr. C. Du P. CHIAPPINI.

On the 28th and 29th March—writes Mr. C. du P. Chiappini, in the course of his reports on his trip to Europe in connection with the co-operative movement—I visited Tralee, County Kerry, Ireland, in order to see what was spoken of as the best equipped bacon factory in the United Kingdom. Tralee itself is a somewhat remote town and is not easily accessible by rail. The route from London lies through Holyhead and Dublin, then on through Limerick Junction, Mallow and Killarney.

The factory was well worth a visit and represents what can be accomplished in any dairy district. I was much struck with the fact which was pointed out to me that dairying and bacon curing are absolutely dependent the one on the other. In the dairies or creameries there is a considerable quantity of separated milk available and this, in conjunction with some cereal or oleaginous food, such as corn, forms the most profitable feeding for pigs. In many remote districts in Ireland the creameries do not utilize the milk to the best advantage and do not carry stocks for pigs so as to use the separated milk. This is a very material loss in itself.



View in Slaughtering House showing Scuttlng Tank, etc. Tralee Bacon Factory.



Chill Room. Tralee Bacon Factory.

So far as I can see, every creamery should have a stock of pigs and feed these from day to day on separated milk. The natural corollary of such a proceeding would be the establishment of bacon curing factories throughout Cape Colony in such centres as would be suitable so as to convert the pigs into bacon at the least possible cost.

I find that this is being done in Ireland at considerable profit.

The Tralee Bacon Factory is entirely a modern one. It was constructed some five years ago and has been considerably enlarged since then. It has now a capacity for handling 1,500 pigs per week and has also recently constructed pig-feeding pens where 500 pigs can be fed at one time. This latter department has been forced upon the proprietors of the factory in consequence of the wastage which occurs in their own creameries in connection with the separated milk.

The factory is situated alongside the Great Southern and Western Railway of Ireland and possesses its own siding where pigs from a distance can be unloaded and where also the manufactured products, such as bacon, sausages, etc., can be loaded up for transport to various places. Most of the bacon is sent to England.

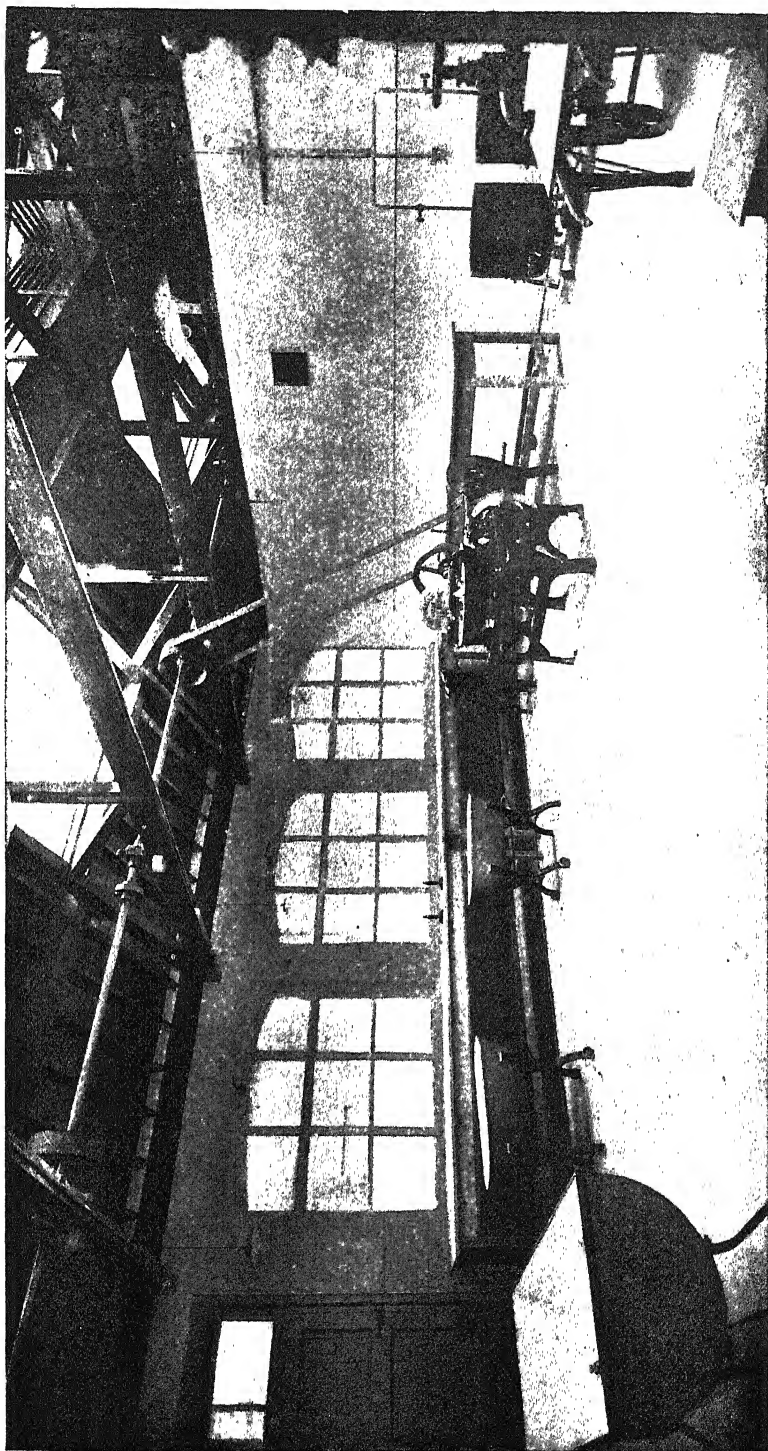
The buildings are constructed upon an area of about 250 feet by 75 feet and are divided into various departments, the one following the other in sequence. The departments are as follows, viz.: Pig pens, slaughtering hall or abattoir, hanging house for preliminary cooling, chill rooms, cellars, offal house, lard rendering house, sausage department, engineers' shop, engine room and boiler house, salt store. In the main front of the building are the baling or despatch room and the general offices, together with a shop where offal, etc., are sold. Over the curing cellars are drying rooms and bacon rolling department, smoke stoves are conveniently placed so as to be loaded from the drying loft.

It is no part of my purpose to describe in detail the equipment of these various departments, suffice it to say that they are furnished with every modern convenience and appliance which would make the work easy and utilise all the products and by-products to the best advantage. The engine room contains some very fine machinery consisting of a large steam engine which actuates the main shafting of the factory and conveys power to the auxiliary departments. Here also are the refrigerating machines which are very powerful and are in duplicate so as to minimise as far as possible the chance of breakdown. The engine room is a very handsome one and kept in beautiful order.

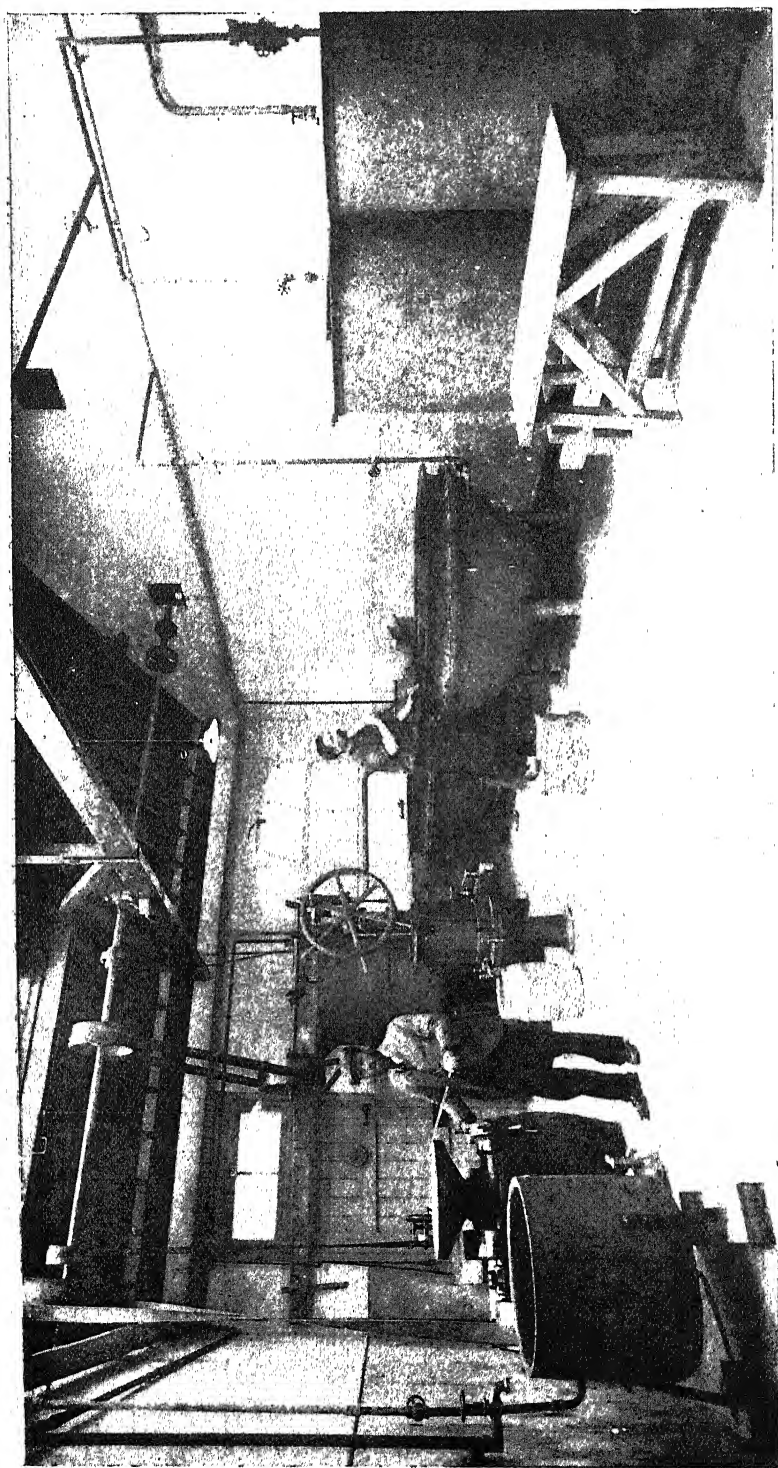
BACON CURING.—The process of bacon curing as briefly outlined to me is as follows:—

The pigs are brought in from the pig-styes and one by one hoisted to a sticking bar by means of a quick winch. They are suspended by one of the hind legs and are immediately despatched

while hanging in the vertical position. A knife is inserted into the neck, passing through the aorta or main blood vessel, and the blood immediately gushes out. The whole operation occupies only a few seconds. The carcase is pushed along the bleeding bar and is thrown upon a receiving table where the leg chains are removed. It is then rolled into a scalding tank which is three parts full of water and has a capacity of about five pigs at a time. The water is kept at temperatures varying from 140 to 180 Fahr. according to the size of the pigs and the carcases are left sufficiently long in this warm bath until the hair can easily be removed by the hand. When this state is reached the carcases are thrown out of the tank by means of a cradle and tilted upon a scuttling table where the hair is scraped off by means of bell-shaped scrapers. If the pigs are intended for conversion into what is known as "Wiltshire" bacon they are hung hind feet upwards on a bar which traverses under a singeing furnace which immediately adjoins the scuttling table. This singeing furnace is peculiarly constructed and is fitted with a circular fireplace encased in a heavy iron frame work which supports the brickwork. A fire is lighted all round the circular fire place (called a "grisset") and intense heat generated. The carcase becomes black and the skin hard and it is lowered again on to the bar and from there pushed into a cold water bath adjoining, which is sunk in the floor. From here it is raised when sufficiently cool and the black surface is scraped off while it is suspended from a bar head downwards. The next operation is to disembowel the animal and this is done very rapidly the whole of the intestines being quickly removed. These are at once taken away to the offal department and are assorted into various articles for sale. The carcase is then pushed along into the hanging house and is there weighed after hanging some hours so that the excess of animal heat may escape. The weighing includes the carcase minus the internal offal, but includes the flake-lard, head and feet. This weight is universally known as the "dead" weight and is the generally accepted basis upon which all pigs are sold. Recently an attempt has been made to introduce the system of live weight purchase which means that the bacon curers buy the pigs by the live weight as evidenced on a scale. The difference between the live and dead weights is about 25 per cent. The difference between the live weight of pigs and the cost of bacon cut in the Wiltshire manner or whole sides, can best be illustrated by the values obtainable at the time of my visit. Thus, live weight pigs were being bought for 41s. per cwt. and this represented bacon as costing 13s. per cwt. more, thus giving the cost of bacon as 54s. per cwt. The selling price of such bacon averaged, according to various weights and selections, 60s. to 68s. per cwt. After the carcases have been weighed they are split in two by cutting down the back and the vertebral column is removed. This is sold as "backbones" and commands a ready sale in the



Sausage Department. Tralee Bacon Factory.



The Lard House. Tralee Bacon Factory.

shop attached to the factory. The kidney or flake fat is removed and is dealt with in the lard house, being converted into lard. The steaks or under cut are taken out and are sold fresh. The head and feet are removed and the sides are then practically "Wiltshire" cut. They are at once pushed into the chill rooms where they are cooled down to 38 F. and are then taken to the cellar where they are pumped by means of a force pump, with a special pickle, in about fourteen places. They are then laid down in rows and sprinkled over with an equal mixture of saltpetre and dry antiseptic powder, upon the top of which is laid a heavy layer of fine salt which is permitted to slowly melt and percolate into the tissues of the meat. The temperature of the cellars is maintained at 42 F. and in 14 days' time the cure is complete, the sides are taken out, washed and packed in bales made by wrapping certain numbers of sides, (such as six) in heavy canvas. In this way the bacon in the green state is sent to market. If required smoked the sides are covered with a fine powdered peameal and placed in the smoke stoves for three days, after which they are packed in barley straw and are ready for market.

These few notes illustrate the very interesting process of making Wiltshire bacon, but there are other and many forms of cured pork produced at this factory. Such for example as hams, rolled bacon, middles. The treatment of these so far as curing is concerned is practically the same throughout with the exception that the carcasses are not singed, but are merely scalded. The bye-products are very numerous and include heads, feet, tails, lard, sausages, black puddings, brawn and other cognate products, all of which contribute to the general profit of the undertaking.

I was careful to enquire the cost of factories to handle various numbers of pigs. Thus the firm of engineers who supplied the whole of the mechanical equipment of this place, viz., Messrs. Wm. Douglas & Sons, Ltd., of Putney, London, inform me that the total cost of such a place may be set down thus:—

Cost of a factory to handle 1,500 pigs per week :

£3,500 for BUILDINGS.

£5,000 for MACHINERY, etc.

Total ... £8,500

As a matter of fact, the cost was a good deal more owing to the proprietors expending much money on the buildings which the engineers would not consider necessary. The working capital of such a factory should be at least four weeks' supplies, say :

1,500 pigs per week x 4 weeks x £3 each—£18,000.

It will be seen that this is a large undertaking, and would not be the type of factory suitable to place in various centres in Cape

Colony in the manner already indicated. I therefore ascertained the approximate cost for factories of smaller dimensions, and append same.

A factory to handle 50 pigs per week would cost about :

£250 for BUILDINGS
£500 for MACHINERY

Total ... £750

A factory to handle 100 pigs per week would cost about :

£500 for BUILDINGS
£750 for MACHINERY

Total ... £1,250

A factory to handle 200 pigs per week would cost about :

£1,500 for BUILDINGS
£1,500 for MACHINERY

Total ... £3,000

A factory to handle 500 pigs per week would cost about :

£2,000 for BUILDINGS
£2,000 for MACHINERY

Total ... £4,000

A factory to handle 1,000 pigs per week would cost about :

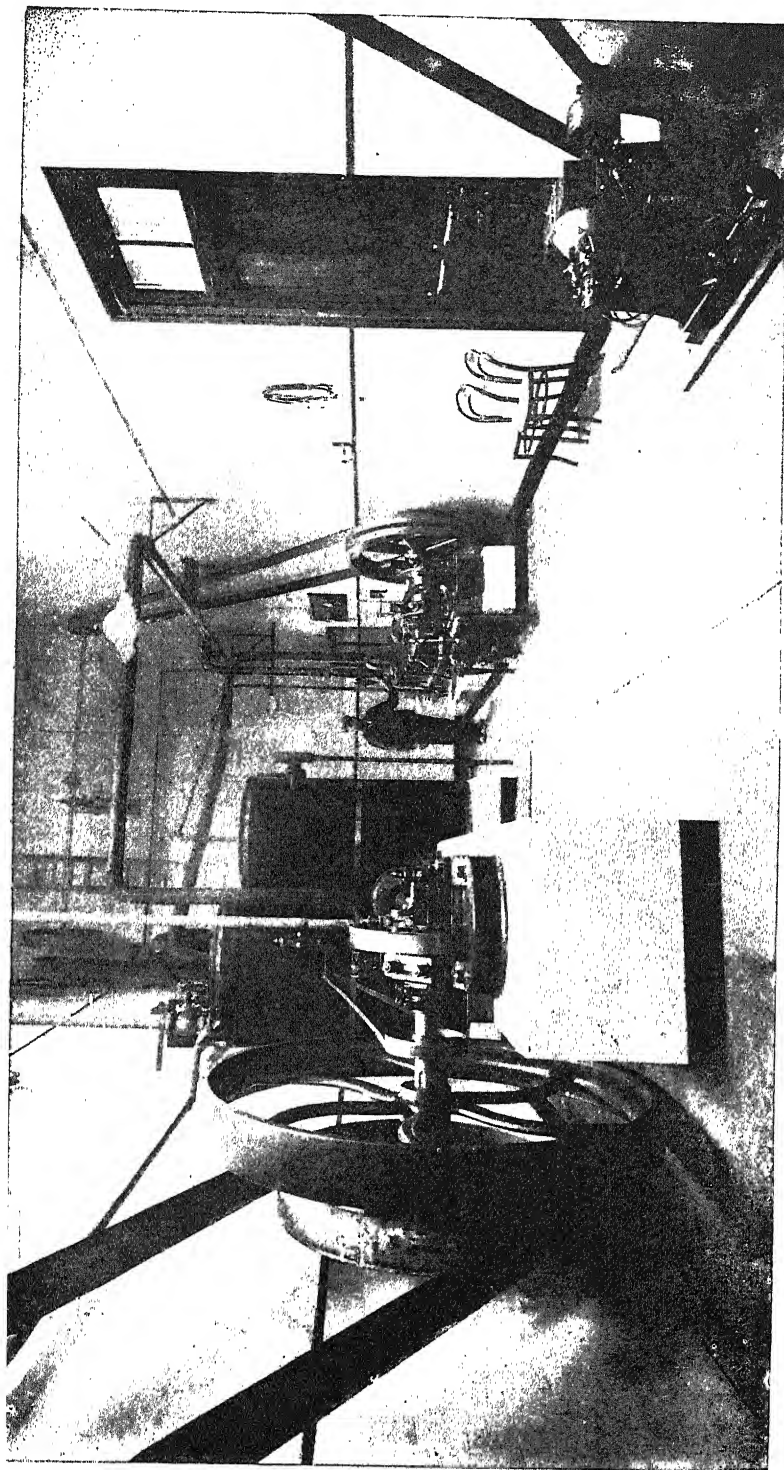
£3,000 for BUILDINGS
£3,500 for MACHINERY

Total ... £6,500

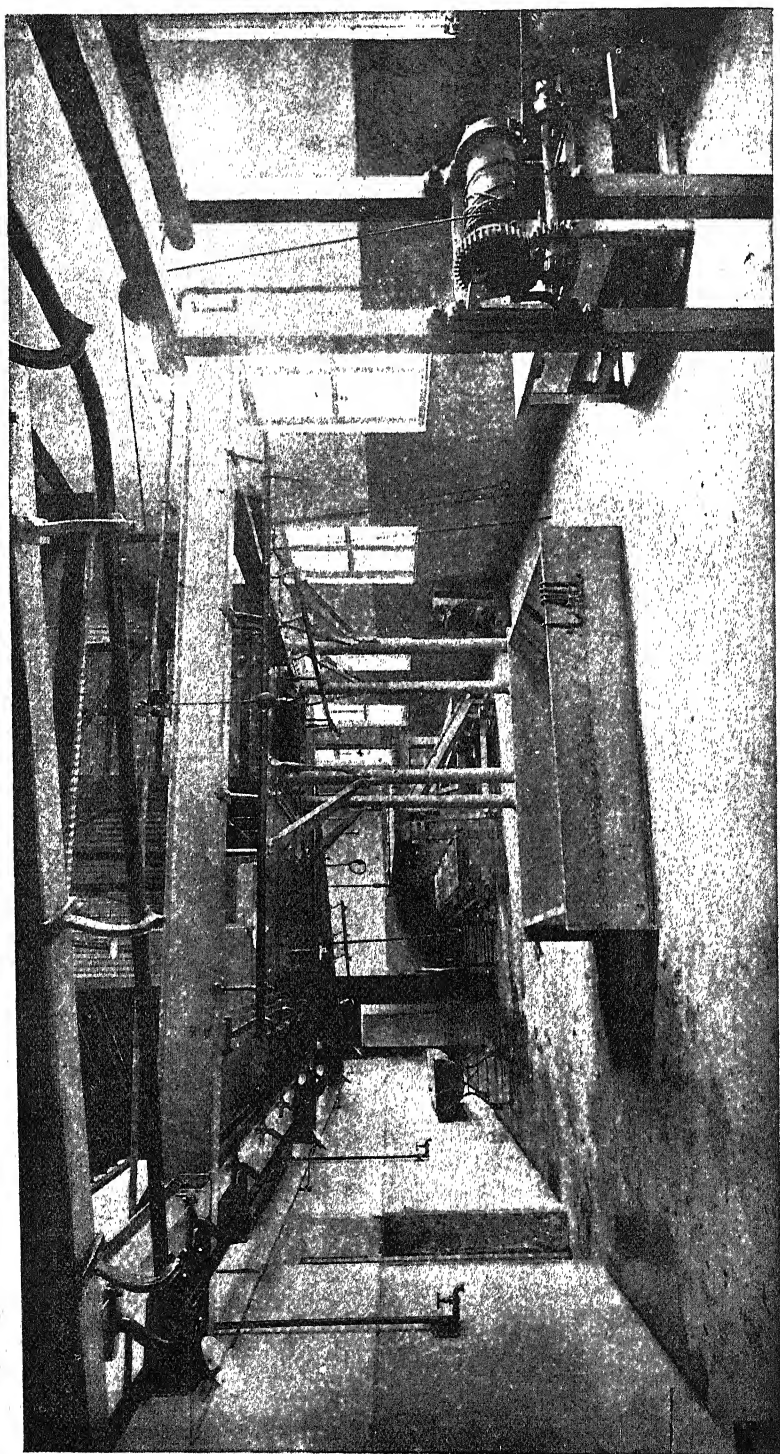
We have already seen the cost of the factory visited.

The working capital for these various factories can be arrived at by multiplying the total pigs to be dealt with by four. It is assumed that the original money paid out for the live pig will be returned in that time.

I was fortunate enough to obtain some excellent photographs of the Tralee bacon factory, and I am much indebted to the manager, Mr. J. E. Prosser, for his courtesy in explaining many details. I am also indebted to the engineers, Messrs. Wm. Douglas & Sons, Ltd., of Putney, for many details. I found that this firm was the only one in the United Kingdom which had specialised the erection of bacon curing factories, and these they have designed and constructed in various parts of the world.



The Engine Room. Tralee Bacon Factory.



Scalding and Singeing House. Tralee Bacon Factory.

I was struck by a recording thermometer, which is fixed in the manager's office. This thermometer, or series of thermometers, is connected by cable to electrodes placed in various positions throughout the factory, and by merely pressing a button and completing the circuit, the temperature at any particular point can be immediately ascertained. In a bacon factory, temperature is everything, and such a scientific device lends itself to the complete control of the business of the responsible manager. The engine man has a similar instrument in the engine room, and as it is his business to keep the temperature right, the instrument is of great value to him, as, while he must know the temperatures, the necessity for ascertaining these by going round the various rooms is entirely obviated. A further development of the thermometer is a self-recording apparatus, which enables a complete record of any one point to be taken on a diagram continuously throughout the day or night.

EXPERIMENTAL CROPS IN CAPE COLONY:

Millets—Sorghums—Mealies.

By DR. ERIC A. NOBBS, Agricultural Assistant.

A striking feature in Cape farming methods at the present time is the growing tendency and desire to grow food for the stock, not simply to be satisfied with what the veld gives in times of plenty, but to take advantage of the growing season or of adventitious rains to produce a crop either for storage as hay or silage or to feed green, by pasturing or by soiling, that is cutting and carrying to stall fed animals.

In some parts such foods are required for winter feeding and there turnips, mangold, vetches, kale and the like are finding a place; elsewhere it is in the heat of summer especially for February and March that this need is felt.

In this latter case it is that summer crops grown either under rain or irrigation are indicated. A number of such at once suggest themselves as at least worthy of careful trial and foremost amongst them are Mealies, Sorghums and Millets. Some notes upon them may accordingly prove seasonable at this time.

MILLETS

to take the least known first. Although strange to most here, this is one of the oldest of crops grown by man, dating back to the remote stone age in Europe and for at any rate several thousand years in China and the East.

The word "Millet" includes a large number of gramineous plants characterised by tall stems, luxuriant foliage, and a generous yield of small grain. In Asia they are chiefly grown for human food, in Europe and America mainly for the green food they supply, for which purpose also they will find their principal use in South Africa.

There are very many different varieties and kinds of Millet, what has been said above is generally true of all, but each has its own merits and peculiarities which have to be studied so as to obtain the best results. The Americans distinguish three groups; the first the Foxtail millets (*Chenopodium italicum*) are characterised as strong rapid growers which stand great heat and comparative drought well. German Millet, one of this class is regularly to be seen at Grahamstown Agricultural Show. The Barnyard millets (*Panicum crusgalli*, *P. colonum* and *P. frumentaceum*, etc) are much slower growing and require four months to mature. They possess less ability to stand drought, and require good soil, growing even on somewhat alkaline land, but produce heavy crops and much seed.

The third group consists of the broom corns (*Panicum miliaceum*) which while not yielding as heavily, mature in much less time than the others. A little of this has been grown for some years in the Tyumie Valley, Victoria East.

Yet another and somewhat different type is the Pearl Millet or Cat Tail (*Pennisetum spicatum*), particularly recommended for providing a succession of quick growing succulent summer green feed especially suited to dairy farmers and cow keepers. For centuries this crop has been known and has for many years been grown in the southern parts of the United States. A few years ago somewhat of a sensation was created by its introduction under a different name and with most exaggerated claims as to its merits.

But even in the official accounts published at the time correcting these misconceptions it was stated that pearl millet can be relied on to give under ordinary conditions a yield of 40 tons per acre in three to four cuttings.

The plant is a very rapid grower, resembling a coarse grass or thin stemmed mealie. It is best cut long before flowering when two to four feet high, and carried fresh to milch cows or made into ensilage or hay. A six inch stubble should be left to enable it to shoot up quickly again. An especial advantage of millet is that it is not necessary, nor even desirable, to await until it matures before cutting it, hence it would seem especially suitable to certain of our higher districts where while the summer is sufficiently warm

yet early frosts preclude the possibility of such crops ripening. Cases in point will be found in the accompanying reports.

For such localities, the more rapid growing though consequently less heavy yielding sorts are to be selected.

In the nomenclature of millets there exists, unfortunately, great confusion. For the purposes of trial the Department is importing from Europe, America, and Australia many differently-named varieties, from amongst which it is hoped to select a limited number, suited more particularly to our necessities and circumstances. A list of these will be found in the September issue of the *Agricultural Journal* (p. 311), and early application for the seed is recommended.

Last season a trial of millets on a limited scale was made, and a still more limited number of reports have been received, which are published herewith as an indication of what may be expected from fuller trial. It is apparent from these reports that September, October, and November are the right sowing months.

Pearl Millet.

Cape (Mr. J. Smyth). Sown 18th November. Result: Good. Grew well from start to finish; cut crop three times; fed to horses; sown on poor ground.

Cape (Mr. F. Rahmer). Sown 29th November. Result: Fair. Weak in some parts, but thick, and as high as 4 feet, in others.

Stellenbosch (Principal, Elsenburg). Sown 4th November. Result: Fair. Yield about two tons to the acre, worthy of a further trial; suitable to district.

East Griqualand (Mr. R. J. Lake). Date not given. Result: Failure. Won't stand frost, otherwise grew well.

Alexandria (Mr. J. Daverin). Sown 28th June. Failed.

Humansdorp (Mr. E. W. Kirby). Date not given. Entirely washed out by flood.

Hungarian Millet.

King William's Town (Mr. W. E. Haynes). Sown October 15th. Result: Good. 200 lbs. from one-eighth acre, partly damaged by heavy rain. The remainder grew about 4 feet; healthy, suitable, and will pay in this district,

East Griqualand (Mr. D. B. Menne). Sown September 22nd. Result: Good. Will pay as a hay crop. 117 lbs. seed from 4 lbs. Not as good as Japan Barnyard millet.

Alexandria (Mr. J. Daverin). Sown 28th June. Failed.

Stellenbosch (Principal, Elsenburg). Sown 4th November. Result: Bad. Failed miserably.

Japan Millet.

Beaufort West (Mr. Paul Nel). Sown 2nd October. Result: Good. Grew splendidly. When about 2½ feet high, nipped by frost. Horses very fond of it; am sowing considerable quantities of it next year.

East Griqualand (Mr. D. B. Menne). Sown 23rd September. Result: Good. 160 lbs. from 4 lbs. seed. A splendid crop, and will pay well, and is very suitable to district.

Alexandria (Mr. J. Daverin). Sown 28th June, 1905. Failed.

King William's Town (Mr. W. E. Haynes). Sown 15th October. Result: Bad. Only a few seeds came up, and these did not thrive.

Somerset East (Mr. R. H. A. Bowker). Sown October 4th. Result: Good. Will pay as a fodder crop, and will make good hay.

Stellenbosch (Principal, Elsenberg). Sown 4th November. Result: Fair. Yield 1¼ tons per acre. Worthy of a further trial; suitable to district.

Culture.

As a general guide, it is safe to say that soils that suit mealies are also well adapted for millets. Naturally on richer soils and under irrigation the best results are to be obtained, and the different millets are not all alike in their power of withstanding drought, nor in the soil they prefer, nor, further, in their yields and rates of maturing.

The soil may well be prepared as for mealies, indeed a corner of the mealie lands set aside for the culture of one or other of the millets, for summer green feed is a practice strongly to be recommended.

Millets are surface feeders and rapid growers, hence they take full advantage of any stable, kraal, or artificial manure which may be given them. On account of the small size of the seed, it is necessary to prepare a fine seed bed by repeated harrowing. The land should be got ready only immediately previous to sowing, so as to kill weeds and enable the millet to keep in advance of the next growth.

On stubble land, where the soil is loose and mellow, it may be sufficient, in place of ploughing, merely to break up the surface by passing a disc harrow over it a couple of times. Newly broken up veld (braak lands) may well be sown with this crop in preparation for others, for which purpose at the present time barley is frequently sown.

Millets are, when young, somewhat sensitive to cold, hence sowing must be deferred until the soil is thoroughly warmed through.

The seed may either be sown at the rate of 50 lbs. per morgen,

broadcast, or 9 lbs. per morgen in drills sufficiently wide to admit of cultivation with the horse hoe.

For green forage thicker sowing is more advisable than where the grain is wanted for seed.

For feeding fresh to horses and cows, young stock and sheep, for which it is extremely well adapted, millet may be cut early, as soon as the heads appear or even sooner; for hay or ensilage, up till the plants come into flower, after which time the leaves and stems rapidly lose their value, the nutriment all passing into the ears, while the stem becomes hard and woody. Millets are excellently suited for making into ensilage.

Common millet and Hungarian millet, which stool well, are suitable for pasture, especially for lambing ewes and calves.

The grain is in many countries used for human consumption, while it is also admirably adapted for poultry feed.

As indicated above, when old and hard, millets deteriorate much in nutritive value. It is as a green food that they are chiefly used, and in this connection it may be mentioned that they exert a laxative and diuretic action by no means harmful, except in excess.

SORGHUM.

Closely allied to the millets and admirably adapted for the same purposes we have the Sorghums of which again there is an almost bewildering number of varieties. This plant has great power of adapting itself in the course of a very few generations to new conditions in which it may be placed. For this reason it seems well suited for experimental cultivation in Cape Colony.

Directly related to the sugar cane we have a number of varieties of Sorghum containing more or less sugar and hence possessing a sweet taste which is very attractive to all live stock.

Sorghum is to be recommended as a summer crop suited for soiling as above described, for pasturage, for hay or ensilage and for every class of farm live stock.

It is fattening and nourishing and, when green, well suited to feed to milch cows. It must not be forgotten however, that Sorghum, like lucerne, if fed to hungry stock unaccustomed to it, may produce hoven (op-blas) while the frost bitten green leaf is also dangerous.

Sorghum will thrive both as regards soils and climate wherever mealies will grow, and, as compared to this crop, produces about a third more feed and withstands drought very much better, but being usually cut while green for feeding to stock or making into hay there is, of course, no grain. A portion should however, always be allowed to mature grain, as local seed, being acclimatised, is preferable to imported seed.

Preparation of the soil is as for mealies, but care must be

taken to have the land free of weeds as Sorghum grows but slowly at first until the root system is well developed, after which it shoots up rapidly.

Sow broadcast at the rate of 120 lbs. per morgen or half that quantity along with an equal measure of beans, when cut together this mixture makes a splendid feed.

The crop may be cut with scythe, sickle, or mower, and may be readily turned into hay or silage if not required for immediate consumption. Usually the crop is harvested when in flower but cutting may begin earlier and in this case a second cut follows.

It will thus be seen that Sorghum is a very easy crop to grow and that a number of different ways of utilising the crop are offered.

A few reports from last year are attached which speak for themselves.

Sorghum.

Paarl (Mr. J. A. Louw, Hermon). Sown 5th October. Result: Good. On sandy brakland, irrigated, broadcast. Very good for horses and cattle, grows well, stands drought and will pay. Sow not later than October.

Stellenbosch (Mr. W. L. Steel). 20th September, 1905. Result: Good. Sorghum produces more milk than mealies and does well wherever the latter thrives, and will certainly pay from my own experience.

Stellenbosch (Mr. O. M. Barry). Sown November and January. Result: Good. Will pay but must be sown later than mealies.

Paarl (Mr. W. Mc. Millan). Sown end of October. Result: Fair. Should have been sown earlier, seed germinated badly, but the few plants stood the drought better than mealies did.

Hermon (Mr. Cecil de Villiers). Date not given. Result: Bad. Bad seed, about two seeds came up.

Aliwal North (Mr. C. G. Hards). Sown September 5th. Stood the drought better than mealies did.

East Griqualand (Mr. B. Menné). Sown 20th September and 4th December. Result: Fair. Sown broadcast on black soil. The first lot gave a good crop of fodder, dry, which the stock like very much. It was just out of flower when the frost came. The second lot was only about 3 feet 6 inches high and not in flower. Mealie fodder is more suitable for us.

MEALIES.

It is not proposed here to discuss processes of cultivation of this crop a question on which however a great deal might with advantage be said as our methods it must be admitted are very far behind those of other countries.

An even more urgent question, however, is the introduction of new varieties particularly earlier and hardier sorts by means of which to extend the area which may come under this crop.

Of recent years only one foreign mealie seems to have reached our shores and found a congenial home here, the Hickory King, a mealie now well established and every season being more widely known.

The oversea importation of mealies and maize products is a no inconsiderable item and there is no question here as there is in other cases of the crop as such being new and untried.

It will be readily admitted therefore that there is every reason to try to increase and improve the sorts of mealies in cultivation. For this purpose it was necessary to turn to the United States of America where the "corn crop," as it is there called, has attained the highest degree of perfection and a number of varieties are being obtained thence for the incoming season for distribution to farmers desirous of trying the same.

It need hardly be pointed out that as the imported seed will almost always be grown in the immediate vicinity of local or other sorts, the seed so obtained will be unreliable for further sowing but that if we but know the names of varieties that prove suitable it is a simple matter for the merchants to import large supplies. In time, as now with Hickory King, the fields of one sort may be sufficiently large, for a sort to maintain its purity. Through a misunderstanding the seed last year arrived too late for many to whom it was sent to sow, but from those who did, the following reports have been received which augur well for further trials this year.

White Flint Mealies.

Cape (Mr. F. Rahmer). Sown 27th November. Result: Good. Both suitable and will pay in this part.

Paarl (Mr. F. J. Weitz). Sown August. Result: Bad. Neither suitable nor will this mealie pay in this part.

Piquetberg (Mr. J. Leonhardt). Sown October 31st. Result: Fair. Is suitable and will pay all right if irrigated.

Victoria East (Mr. Joseph Amos). Sown 11th December. Result: Bad. Broadcasted and irrigated and treated in 10 bags cattle manure per acre.

Piquetberg (Mr. A. Wagner). Sown 15th November. Result: Good. On sandy garden soil well manured and irrigated. A very good fodder plant for cattle because of the numerous shoots of green fodder from 3 lbs. of seed but it does not stand wind so well as the White Dent and was much injured by the grub.

White Dent Mealies.

Piquetberg (Mr. J. Leonhardt). Sown 31st October, 1605. Result: Fair. Is suitable, and will pay all right if irrigated.

Hanover (Mr. H. S. van der Merwe). Sown 2nd January, 1905. Result: Good. Both suitable and will pay in this part. A little later than the other mealie.

Vryburg (Messrs. Cardwell & Harper). Sown 27th December, 1905. Result: Good. Both suitable and will pay. I am rather struck by this mealie, it is both early and good.

Victoria East (Mr. Joseph Amos). Sown 11th December, 1905. Result: Fair. Broadcast and irrigated. Sown late, hence not fair result, but the yield was not as good as those earlier sown, German, Yellow and Large White.

Paarl (Mr. F. Weitz). Sown August. Result: Bad. Neither suitable nor will it pay.

Cape (Mr. F. Rahmer). Sown 28th November, 1905. Result: Good. Both suitable and will pay, but not as well as Thoroughbred White Flint Mealies.

East Griqualand (Mr. R. J. Lake). Sown 10th September. Result: Bad. Drilled and treated with rock guano. Destroyed by grubs.

Piquetberg (Mr. A. Wagner). Sown 20th November. Result: Good. 3 lbs. of seed yielded about 200 lbs. grain on land irrigated and sown somewhat late. Attacked by grubs.

Murraysburg (Mr. David J. Bosman). Sown 15th October. Destroyed by nestwurmen.

THE STORING OR PICKLING OF EGGS AND THE HANDLING OF LUMP BUTTER.

Experiences in Ireland.

BY MR. CHAS. DU P. CHIAPPINI.

In the course of his reports on his recent visit to Europe in connection with the co-operative movement, Mr. C. du P. Chiappini says :—

When I visited Tralee I had the opportunity of seeing the methods in use for the handling of eggs fresh and in pickle. I also witnessed the processes of handling lump or farmers' butter. It appears that in Ireland these two businesses are invariably conducted together.

EGGS.

The fresh egg trade is a considerable one in County Kerry, and has given rise to many collecting businesses where merchants form depôts and buy eggs in small quantities. It is obvious that a small farmer is unable to find a profitable market for a small quantity of eggs, whereas a merchant handling these in the aggregate is able to select and grade them so as to suit various markets. The same thing can be done by mutual co-operation, as the place of the merchant can, in Cape Colony, be taken by the farmers' co-operative society.

I witnessed some transactions in eggs at the egg and butter depôt belonging to Mr. T. Mangan, Rock Street, Tralee. Fresh eggs are brought in in any quantity from one to twenty dozen. They are bought by the "long" hundred, that is to say that a "hundred" of eggs is actually 120. At the time of my visit 120 eggs were bought for 5s. 6d., and these weighed 16 lbs. or thereby to the 120. The weight is a very important thing, as it regulates the price. Such eggs are packed in wood-wool or straw, in boxes containing 1,440, and these boxes are divided in the middle, so that they can be sawn through and two complete halves remain. A "hand" of eggs is six (you can conveniently lift three eggs with each hand), and twenty "hands" is a hundred. Hence we get at the origin of the long hundred.

PICKLING EGGS.

I subsequently had the opportunity of seeing the process of pickling eggs at the establishment of the Co-operative Wholesale Society, Ltd., Pembroke Street, Tralee. Mr. James Turnbull, the manager, was kind enough to give me much valuable information.

It would appear that during certain months of the year eggs are comparatively cheap, and, as happens in all countries, there are months of scarcity. The object in pickling is to keep the eggs over from the plentiful until the scarce season. At this depôt about 100,000 fresh eggs are handled per week, and about 1,000,000 pickled eggs per annum. This depôt has large concrete vats ranged in a long low building, with a four feet passage-way between. The capacity of the tanks is 1,769 gallons, and contains 13 cwt. of slaked lime and $11\frac{1}{2}$ cwt. of salt, all stirred up until saturation is reached. On the small scale, 270 gallons of water contains 2 cwt. of slaked lime $1\frac{1}{4}$ cwt. of salt. The solution, after being prepared, is pumped or decanted off, so that there is little or no sediment in the pickling tanks. Eggs placed in this solution will keep for eight or nine months in a fresh condition, and realize a good price as pickled eggs at the end of that time. Thus, last year when fresh eggs were being sold at 9s. per hundred (120), pickled eggs fetched 7s. 2d.

One of the difficulties to be contended with is the summer temperature. When this reaches 55 F. in the egg pickling rooms, there is danger of taint in the eggs, and this can only be avoided by the application of refrigerating machinery, so as to keep the temperature down to as near 45 F. as possible.

In an egg trade there are considerable breakages, but these do not mean waste of the contents of the shells. The broken eggs are collected, and the contents are extracted in a hydro extractor, this being a separating machine which is driven at a high speed, and by means of centrifugal action discharges the egg contents, leaving the shell behind. The product is termed "Melange," and is in great demand for confectionery purposes.

There are other mechanical appliances used for handling eggs, such as egg-testing machines and grading trays, but the capital required for such stock in trade is very small.

The sizes of the boxes used for packing eggs are as follows:—

1,200 eggs case measures 5 ft. 10 in. x 2 ft. 9 in. divided in centre and when sawn makes two complete halves; 600 eggs case measures 2 ft. 10 in. x 2 ft. 9 in. (half the above); 300 eggs case measures 1 ft. $8\frac{1}{2}$ in. x 2 ft. 9 in. inside measurements. Four layers in each side of a 1,200 case contains:

each 180	720
	720

1,440 eggs.

LUMP BUTTER.

At both of the establishments already referred to I examined the process of receiving and handling lump butter. This butter is made by small farmers and brought in the fresh state (unsalted) to statutory fairs where the buyers of butter factories attend, or the farmers may deliver the butter in the lump to the factory owners' depôts direct. The butter varies very much in texture and in colour and for this reason must be made of a uniform shade so as to suit the market. As the butter is fresh it has to be salted, and in order to produce uniformity colouring is also added. The colour used is extract of annatto. The salt added varies from 1 to 2½ per cent.

The blending of the butter, as it is called, is preceded in summer by the lumps being placed in a cold chamber so as to harden them. They are then worked on a circular butter worker and made uniform. At the same time the excess of butter milk is expressed and the butter is washed with cold water. In summer, when the greatest supplies of butter are available, the cold water for washing the butter is produced by the aid of refrigerating machinery. When the butter has been rendered uniform in appearance, it is packed in 14, 11, 56 and 112 lb. packages and is in that state sent to the market. All British made butter contains at least ½ percent. of a dry antiseptic, during summer, in addition to the salt. It seems to me that this collection of butter, like the collection of eggs is eminently a business which farmers might co-operate in carrying out. Butter consumers must have uniform products, and where small quantities of butter are produced it seems to me quite obvious that uniformity is impossible. The only remedy therefore is to establish co-operative centres at which butter will be made marketable and eggs can be collected and distributed in marketable quantities.

It may be noted that the difference between factory butter and that produced in the creamery is 10s. per cwt. The creamery butter being reckoned the superior quality to that extent.

INSECT PESTS AFFECTING FRUIT TREES.

LECTURE BY MR. C. P. LOUNSBURY, GOVERNMENT ENTOMOLOGIST.

At the meeting of the Paarl Farmers' Association, held on Tuesday, 28th August, in the Town Hall, Paarl, Mr. C. P. Lounsbury, B.Sc., the Government Entomologist, delivered the following lecture on "Insect Pests Affecting Fruit-trees."

CAUSES OF PESTS.

To achieve success in their calling, he said, fruit-growers must first of all be what we term "practical" men, and as practical men most of my hearers have doubtless come here this morning in the hope of adding to their store of information on ways and means for combating the insect and fungus enemies of their trees, and they may be somewhat impatient with any consideration of the mere causes which have given rise to these obstacles. But it seems to me that a little thought and reflection on the why and wherefore of the pests is not only interesting in itself, but a vigorous stimulus to the application of remedial measures, and, therefore, I propose to spend a few minutes on this phase of my subject before taking up more practical features.

It is a common idea in this country that insects and diseases are not natural to healthy trees, and that if soil and climatic conditions are wholly favourable to the growth of a tree and the production of its fruits, pests will not appear, or, at least, not be able to do serious damage. Were this idea well founded, fruit-growing at the Cape would be almost too easy to be profitable, for few countries are blessed with better soil and climatic conditions for fruit-trees than are to be found in our numerous kloofs and valleys. There may exist a few of the higher plants which are not subject to destructive insects and disease attacks; but certainly none of our fruit-trees are included amongst them. These are all subject to pests almost innumerable, and the healthier and more vigorous they chance to be, the better they are suited to the wants of many of these enemies, though true it is, of course, that there are insects and diseases that thrive best on weakling trees.

The point I wish to emphasise is that the trees are naturally subject to the attack, and this is true of every part of them, root, trunk, branch, bud, foliage, and fruit. Perhaps reference to a few of our native plants will render my meaning clearer. Take the common thorn-tree (*A. horrida*), for instance. Probably no tree growing in South Africa has a greater variety of pests, fruit-trees by no means excepted. Six or eight native species of scale insects infest it, caterpillars devour its foliage and several fungi infect and distort its buds, thorns, and foliage. Even where it is growing most luxuriantly, it is almost always richly supplied with enemies. Or think of the proteas which abound in the veld around here. You will probably recall having noticed that they swarm with insects, which are present to feed on their leaves and flowers, and perhaps you have noticed that several kinds of scale insects are peculiar to them.

The silver tree of Table Mountain, so beautiful and perfect at a distance, is, on close inspection, also seen to bear various native scales and leaf-feeding beetles and caterpillars, and the stems of many specimens are riddled by destructive borers. The common mesembryanthemum (Hottentot fig), even when vigorously growing, is often studded with scale insects peculiar to itself, and a grub may infest its fruit. The fruits of a great many of our wild plants are severely injured by insects. A tiny, wasp-like insect (*Megastigma*) infests the abundant seeds of the Karreeboom in the Karoo, and almost every kernel may be eaten out. A native fruit fly infests the pods of the common asclepiad (Melkbosch), another sometimes finds most of the fruits of some wild members of the melon family, still others infest Kei apples and other wild fruits, including the common blackberry. A tiny kind of fruit fly specialises in the berry of the Kalk Bay bush (*Lycium afrum*), and a certain caterpillar is about as severe a pest to the fruits of the common bitter apple as the codling moth is to apples or pears. If our wild plants were to be cultivated for their fruit, it would doubtless be advantageous in the case of many of them to use measures against their insect foes.

That fruit trees have a greater variety of ills in the countries of their origin than in lands to which they have been introduced was impressed upon me during my recent visit to Brazil by the comparative conditions of custard apples and guavas here and in that country. These fruits in South Africa are singularly free of troubles, but in Brazil, where they are native, they are rich in enemies, insect and fungous. Nearly all the custard apples which I saw contained either a caterpillar comparable with the codling moth or the maggots of a kind of fruit fly. Guavas of various species are grown for ornament or for their fruit, but very little of the fruit appears to escape one or another of the numerous pests. At Bahia it is subject to a kind of rust, a caterpillar borer, a beetle grub, and a fly maggot. Thirty-eight out of forty guavas which I

shook from trees in one garden developed maggots, and these all of a species supposed to be native to Brazil.

However, the injury done to native trees by native pests is, on the whole, less severe ordinarily than the injury done by pests to cultivated fruit trees. The native plants suffer from a greater variety of pests, yet the injuries inflicted to the fruit trees are often far more serious, there being present a greater abundance of insects of any one kind. The explanation is simple. Our cultivated fruit trees are all of kinds introduced from oversea, and few of them are related to the wilds plants of the country. Their enemies were left behind in the original introductions, and not many of the native troubles spread to them; and thus at first they were comparatively free of pests. They would to this day have remained so were it not for the gradual acquirement of oversea pests.

FACTORS IN PEST SPREADING.

The introduction and spread of these has increased by leaps and bounds with the increase in facilities for transportation. Steam navigation and railroads have been potent factors in spreading pests all over the world, and to our increasing commerce with other lands may we attribute the introduction of many of the destructive insects that have brought trouble and expense to our fruit-growers during the last generation or two. Commerce brought the phylloxera, the Australian bug, the red scale, the codling moth, the pear slug, the woolly aphis, the white peach scale, and, perhaps, the fruit fly as well. Many introduced pests are yet limited in their occurrence; but gradually, aided, most of all, by our railroads, they are becoming wider and wider disseminated. The Government is now endeavouring to do what is practicable to prevent further introduction, and to retard the spread of those already in the country; but, despite of everything possible, the evil is bound to continue to some extent. Thus, whilst our indigenous trees suffer chiefly from native insects and diseases, our fruit trees suffer mostly from introduced troubles. Introduced insects find here some advantages over the conditions governing them in the place of the origin. All insects you are aware, are endowed with prodigious powers of multiplication to ensure the continuous existence of their kind, despite of temporary adverse circumstances and the attacks of enemies. Many plant-feeding insects pass through several generations in the course of a single season, and lay many dozens, or even hundreds, or thousands, of eggs. In its native home such an insect might never become sufficiently abundant to seriously injure its food plant, for birds, bats, and other animals, as well as parasitic and predaceous insects and fungoid and bacterial diseases, might hold it in continual close subjection. It is obvious that in a country new to it, with its associations with many of its old enemies ended, an

insect may be relieved to a great extent of the restraints which, in the course of long ages, have become sufficient to control it. Hence it is in part that introduced insects, as a whole, are more troublesome than indigenous ones, and why, in South Africa, fruit trees are much troubled by insects when in reality their own insect pest are comparatively few in number of kinds.

Other causes for the development of injurious insects and plant diseases into veritable pests in orchards of fruit trees are to be found in the wholly unnatural conditions under which the trees are grown, and in the unnatural development of the fruit itself. The fruit-grower plants large numbers of the same kind of trees together, and more or less in a variety of ways renders the environment uncongenial for some of the forces which, under purely natural conditions, would tend for the suppression of the insects that attack the trees or their fruit. In other words, the methods in planting, pruning, cultivating, and otherwise treating fruit trees, necessary to secure the maximum return of good fruit, may tend to promote the spread of pests, whilst discouraging the birds, insect-feeding animals, and other checks, which would be effectually operative under those conditions in which an unimproved fruit tree of any given kind would grow uncared for in the forest or field.

Altogether, it is plain that the conditions which account for pests amongst our fruit trees are largely artificial. Under the most natural conditions, injurious insects and diseases would contest with man for the products of the fruit tree, but man's interference has intensified the capabilities of some of the insects and diseases for mischief. There are some people so narrow in their views that they oppose the destruction of insects by spraying and fumigating, with the plea that such measures are unjustifiable, because quite unnatural. Such folk overlook the fact that almost everything about a modern fruit tree is unnatural, and a man who plants an orchard should have no compunction against extending his unnatural operations in any way that, with safety to himself and the public, promises to assist him in getting the maximum of perfect fruit.

INEFFICIENCY OF NATURAL ENEMIES.

It is again often argued that the only proper way to combat pests is to restore the natural enemies which they left behind in their spread from country to country. I shall have something to say about this subject when considering the codling moth and the fruit fly, and here I wish to introduce only a few generalities, and to again assert what I have already said, in other words, that it is in the nature of things for the fruit tree to have insect and fungus enemies, and that under the most natural conditions these would contest with man for the products of the tree. I may add

that in most instances they would get a greater share than any fruit-grower would care to stand by and see them take if he could help it. But, as pointed out, the conditions in a fruit orchard are far from natural, and I have no doubt that in many cases the forces which made and which keep the injurious species superabundant are quite apart from natural enemies. Instances can be cited of native insects being very destructive to fruit trees year after year, although all their natural enemies are present. The case of guavas in Brazil is one of them. Doubtless much towards the suppression of injurious insects may be done by encouraging their natural enemies that are at hand. Tolerance should be shewn to birds, bats, toads, lizards, and non-venomous snakes that destroy insects. Too often do the fruit-growers allow the death-dealing catapult to be indiscriminately used by children, in the amusement of bird-shooting, and the men themselves might well spare the gun when insectivorous birds indulge in a dessert of fruit. Insect-eating birds are amongst the most powerful checks on the pests of our orchards, and are forces which it is within the power of the fruit-grower to influence for his benefit or his loss. It is not practical to do very much to directly encourage beneficial insects, but one should at least leave scale and aphid-feeding ladybirds in peace, also the curious little scale-eating caterpillar that disguises itself with the skins of its victims. Only a few ladybirds are injurious species, and these are readily recognised.

ARTIFICIAL REMEDIES.

Washes of one sort or another have been applied to plants for the destruction of insects and fungi from time immemorial, but far more progress has been made in the last generation, both as to the substances employed and the means of applying them than in all previous times. The rapid improvement of recent years has been due in part to the great extension of fruit-growing as a special industry, but much more, and more directly to the absolute necessities of remedies for pests newly introduced into the orchards and vineyards of Europe and America. In the old days trees were dosed for the destruction of insects and diseases with almost anything nasty that was at hand, just as to the present day the backveld farmer doses his sick animals. Decoctions of dung, urine, ashes, bitter, acrid and narcotic plants, such as tobacco and quassia, and various complex mixtures, containing such things as soot, lye, salt, tar, turpentine, lime, sulphur, pepper, soap, vinegar, and oils of all kinds are soberly described and recommended in old books, and these were applied with swabs, brushes, squirts, and clumsy pieces of apparatus termed garden engines. When the urgent need of more exact knowledge of remedies came, however, improvements rapidly began to take place, and progress is still being made, both in the remedies and the means for their application. The fruit-

grower of the present day has more pests to contend against than his forbears, but he has the advantage of remedies based on careful experiments, and with the element of cost fully considered. Insecticides are now divided in two great classes, one killing from the outside by smothering or by contact, and the other killing by internal poisoning. The first class or contact insecticides comprises fumigation and such preparations as lime-sulphur wash, resin wash, and paraffine emulsion, measures which are chiefly used against sucking insects. The second class or poison insecticides are chiefly made up of insoluble preparations of arsenic, and are designed for insects which bite and chew the foliage or fruit.

PARIS GREEN AND ARSENATE OF LEAD.

I wish to briefly sketch the history of the arsenical insecticides and the means for applying sprays, and then I will proceed with a short discussion of our principal insect pests and the remedies applicable for them. Forty years ago fruit-growers were strangers to arsenical poisons, and they might be yet, had it not been for the American potato-bug scourge. That devastating insect between 1860 and 1870 threatened to extinguish potato culture in America. It spread eastward from its native home near the Rocky Mountains, and in sheer desperation, every substance that seemed the least likely to destroy it was tried by the afflicted farmers. The extremely poisonous properties of the paint pigment known as Paris green doubtless suggested the trial of this substance, but who first thought of it and when is unknown. However, a knowledge of its success in destroying the voracious insect cheaply and without killing the plants became established by 1868. At first it was used pure, or mixed dry with flour, ashes, or lime, but after a few years, improved apparatus for applying sprays were put on sale, and then the water mixture came quickly into vogue. In 1873, apple trees began to be sprayed with it, to kill leaf-feeding caterpillars, and about five years later it was observed that the application had the effect of reducing the percentage of worm-eaten fruit. From then until now Paris green has been a popular remedy for the codling moth. For a long time it has been recognised that Paris green is a needlessly expensive and far from ideal preparation of arsenic for spraying, but manufacturers had meanwhile learned how best to prepare it for this particular purpose, and the public has, until recently, preferred to pay the extra price rather than accept the cheaper substitutes, theoretically superior, but lacking in established reputation, that have from time to time appeared on the market. At last, however, Paris green is losing its hold. Arsenate of lead is taking its place. This latter preparation was prepared and brought to notice in 1892 by the Gypsy Moth Committee of the Massachusetts State Board of Agriculture, and the experience of the last 14 years has clearly established its superiority

over other arsenicals for spraying fruit-trees. Until this year it has been impracticable to get the ready prepared article in the Colony at a price low enough to induce growers to purchase it freely in place of Paris green. This year, as was published in the "*Agricultural Journal*" last month, this objection to adopting it has been satisfactorily overcome. The retail price is now only 9d. a pound, which is less than half what it was last year.

Freshly-made arsenate of lead, or a well-made prepared article, has several advantages over the best Paris green. (1) Even when used extremely strong, it does not scorch the foliage. (2) It is flocculent in character, not granular, and is very easily kept in suspension in water. (3) It dries on the sprayed surface far more uniformly than Paris green, and adheres much more tenaciously. (4) It is white in colour, and at the strengths in which it is usually employed, it shews on the foliage. The prepared mixture is easily mixed with water, and contains nothing gritty to wear the pump or choke the nozzles, as it is quite unnecessary to use lime with it.

The preparation is formed by mixing a solution of arsenate of soda with acetate or nitrate of lead. If the correct proportions are used and the solutions properly mixed, a preparation made on the farm is as good as the best manufactured. Last year Messrs. James Robertson and Co., of Cape Town, imported a large quantity of the two ingredients, and the firm is still prepared to supply them, weighed out in the proper proportions for mixing. The arsenate of soda ingredient by itself is very destructive to vegetation, and some will remain in the water unless enough of the other ingredient is used. The advisability of avoiding any brand of arsenate of lead not reputed to be fully reliable is obvious, as is also the risk of using a home-made preparation, the proportions for which are not carefully determined.

It has not been found possible to dry this flocculent precipitate and still retain to the full the characteristics of settling slowly and clinging tenaciously to the foliage that give special value to the freshly-prepared article. If kept as a paste, however, the article remains practically as good as when freshly prepared. In some respects a paste preparation is less convenient than one in powdered form, so it is unfortunate that drying detracts from its value. A few manufacturers, probably in ignorance of the deleterious effect of drying, have sold to merchants preparations in powdered form, and two or more makes of such dry arsenate of lead have been sold for use in the Colony. Both are all right chemically, but for the reasons given I cannot recommend them.

THOROUGHNESS IN SPRAYING.

It would take too much time to go into details concerning other spraying preparations, but the opportunity of speaking about their application to trees must not be wasted. Success in all

spraying operations depends very largely on thoroughness of application. One fruit grower may accomplish more with one spraying than another with three, merely through a little additional care in the application. No matter whether the spraying is with resin wash for red scale on orange trees, lime sulphur wash for Bryobia mite or prune trees, paraffin emulsion for woolly aphis, or Paris green or arsenate of lead for codling moth or pear slug, the most important thing to insist on is thoroughness of application. Spraying is not merely putting so much insecticide over a tree. If the material is a contact insecticide, it should be directed so as to cover every insect, which it is intended to destroy, and if it is an arsenical poison every particle of surface that requires protection should get its coating. I dwell on this matter, because a great deal of the spraying done in this country is badly done, and being badly done is more or less unsatisfactory.

To get the best results requires the use of a powerful pump and proper nozzles. At the present time the favourite type of spray pump in this country is the "bucket" pump. The common design sold is a very good one, and it does very well for the novice in spraying, and for the amateur gardener. But when once a fruit grower is convinced that it pays him to spray, it is time he considered the purchase of a more powerful pump. If he has thousands of trees to spray, he would probably be well advised to get one that will easily supply four or six nozzles with liquid under a hundred pounds of pressure, as shewn by a gauge. For the purposes of most of the people here to-day, however, barrel pumps would probably be chosen for reasons of economy. Designs like the Eclipse, Spramotor, Peerless, and Pomona give almost perfect satisfaction if they are kept working smoothly, and the men working them made to maintain a heavy pressure. These designs are all stocked by one or more merchants in Cape Town. A few power-worked pumps are in use in the country, but I am not yet convinced that they are any more satisfactory or cheaper in working cost than the most powerful hand pumps. In America they are rapidly supplanting hand pumps in the great fruit-growing districts, but there labour is more expensive than here, whilst fuel and the cost of repairs are less.

THE CODLING MOTH.

As I stated some minutes ago, there is not a great variety in the pests of our fruit trees, but there are, nevertheless, too many kinds to admit of all being discussed in an address like the present. I therefore propose to limit my remarks to a few of the worst. Of them all, the codling moth is, perhaps, the one of most general interest in Paarl at the present time. It is needless to describe this insect to those present, but those to whom it is least familiar may learn something from an examination of this box of specimens

It shews the adult insect, the caterpillar, pupa, and cocoon, and a few parasites.

The original home of the codling moth is not definitely known, but it is supposed to be South-east Europe, the home of the apple. It has been taken with the fruit of the apple almost all over the world, and in this way has become widely established in North and South America, Australia, New Zealand, and South Africa. It is said to be mentioned in a Roman treatise on agriculture, published over 2,000 years ago. The first mention of it in American books was made in 1819. About 1855 it got to Australia, and 20 years later to New Zealand, and about the same time, 1874, to California. American writers say it was reported from South Africa in 1885, but the authority for the statement is not obtainable. However, it was found common in Graaff-Reinet in 1893, and two years later was observed in Constantia. Its spread since, particularly after the close of the war, has been rapid. I suspect it got to the country with apples from Madeira, brought by steamship passengers. The caterpillar, as you well know, often accompanies the fruit. It crawls away when ready to leave, and spins its cocoon in any convenient shelter. Thus, it travels in apple baskets from Madeira to the Cape, or in boxes from Australia, or barrels from Canada, and similarly it has gone from Paarl to a long list of places on our railways. When the receptacles are emptied of their fruit at the destination, they are generally thrown aside without a thought of the pest. The caterpillars in due time become moths, and you can safely be left to imagine the rest. So far, the Albany and Bathurst districts, in which there are many splendid apple orchards, are believed to be free of the pest, and it is not yet recorded from any of the frontier districts south of Queen's Town. Most of the towns to which Western Province apples are sent now have it established in their gardens, and these include Beaufort West, Kimberley, Bloemfontein, Aliwal North, and Cradock.

Apples and pears, it is needless to tell you, are the principal sufferers by the insect. Quinces are freely attacked in some places, and plums, peaches and apricots may all come in for a share of the trouble where the insect is very abundant. Naturally, the stone fruits suffer most in the vicinity of apple and pear orchards. The losses through the pest appear to be serious wherever it occurs, but to be much more serious in warm climates, as in South Africa, Australia and California, than in cold climates, as in the British Isles, Northern Europe, and Canada. The difference is in part due to there usually being only one brood a year in the colder climates, whilst at least two ordinarily occur in the warmer. Considerations which have already been discussed would lead us to expect greater relative damage from the pest in South Africa, where it is a new pest, than in Southern Europe, where it has been known for hundreds of years; but there is considerable reason to doubt that any difference that does exist is attributable

to factors which we could easily get established out here. It is doubtless known to many of you that the West Australian Entomologist, Mr. Geo. Compere, collected large numbers of a certain Ichneumon parasite in Spain about twenty months ago, on behalf the Californian State Government. He claims that in the district where he found the insect the codling moth is a second-rate pest and artificial remedies are not at all necessary to secure good crops of apples, and he appears confidently to expect that its introduction into California will practically rid that State of the pest. I most sincerely hope that his opinions are well founded, but there are sufficiently grave reasons for doubting the value of the parasite to lead us to be content with awaiting the outcome of its establishment in California, before we incur any expense to get it into this country. The parasite has long been known to entomologists, and is said to have a wide distribution in Europe; and, though I have no information about the codling moth from where Mr. Compere collected his specimens other than what he has given himself, it is very clear that in many parts of Europe, not very remote from there, the pest levies a heavy toll. The magazine and newspaper stories that the parasite has already done marvellous work in California are misleading in the extreme. We are keeping in close touch with the authorities of the State on the matter, and the most that can be said is that they appear to have succeeded in establishing the species in some orchards. The last advice was a letter from Entomologist Ehrhorn, which came less than a month ago. He wrote: "In regard to the codling moth parasite, I can say that where liberated, and not molested by sprays, it established itself last season. It is too early to say what will be our result this season. I will let you know."

CAPE ICHNEUMON PARASITES.

At the Cape we have found that three species of Ichneumon parasites attack the codling moth. None of these, however, appear to be of much importance. We were very hopeful in regard to one of them two years ago, and thought then that it might be advisable for fruit-growers to take certain steps to encourage it, but it was so uncommon this last season that no trouble on its account would have been worth the while. The idea was to confine the larvæ and pupæ wherever found within a box instead of destroying them, making provision for the parents to escape through a wire gauze, too fine to permit the moths to pass.

The codling moth lives through the winter in the larval stage within a cocoon. Some larvæ secrete themselves under loose bark, as shewn by the specimens in the box which has been passed around, others hide under clods of earth on the ground, and many in and about the rooms where apples and pears have been stored. In the spring the larvæ change to pupæ, and within

a few weeks the pupæ become moths and emerge. The development is irregular in this climate, and emergences of over-wintered specimens occur from early in September to the 1st of November, or even later. The eggs are laid on or near the young fruit, quite commonly on the leaves early in the season. The young larvæ, to get into the fruit, must eat away some of the surface, and they often feed a little on the foliage. Modern methods of control are based on these facts. Spraying with an arsenical poison is practised to have the young worm get poisoned before it can get within the fruit; bands are placed about the trunks of the trees to give the larvæ that come from the fruit a place to hide in that can be readily reached, and the windfalls are collected and suitably disposed of as a further supplementary measure.

Before the value of arsenical poisons for the control of the pest was discovered, the use of bands and the care of the windfalls were the best means known. All sorts of material have been used for bands, but the strips of heavy hessian or bagging ordinarily used in this district answer as well as anything. One band around the trunk is generally regarded as sufficient. It should be put on towards the end of November, and a watch should then be kept for the appearance of worms in it. A week or so after the first are seen, all the bands should be searched and the trapped larvæ destroyed, and thereafter a search should be made regularly at least once a fortnight, until after all the fruit is harvested. The bands may be allowed to remain on through the winter to trap larvæ which may be disturbed from the ground by cultivation, but there is no need to examine them between April and September 1. About the latter date, however, a thorough search should be made.

Spraying alone is depended on in many of the largest American orchards, but I believe it is advisable to use bands as well in the Colony. A number of applications of the poison are required, however well the work is done and the spray adheres. It is of no use spraying until many of the blossoms have fallen, and of little use spraying before the first blossoms which fall have been off a week. To spray unnecessarily early is worse than useless, for the welfare of the insects that visit the blossoms for nectar should be considered. There was considerable discussion in American entomological circles a dozen years ago as to the effect on bees of spraying fruit trees when in bloom, and one prominent expert succeeded in bringing forward rather conclusive evidence that many bees become poisoned and die. But under our Cape conditions it is generally necessary to spray before all the blossoms are off, notwithstanding the liability of poisoning some bees. A second application should be made a week or ten days later to put poison on the fruit that have formed after the first spraying. A third spraying two or three weeks later, if with arsenate of lead, should leave the fruit well poisoned for the first brood of the pest. At least one more spraying for the main crop of apples appears

advisable, and this should be timed to catch the second brood, say about the middle of January ; if very much of the pest is about, two late sprayings, one about January 10 and the other about three weeks later, may be advisable. Some growers prefer to spray much more often, but the writer doubts the necessity of such procedure if the spraying is properly done. It is better to trust to two really thorough sprayings than half-a-dozen carelessly applied ones. The work should have very thorough supervision, much more than is usually given to it, both at the pump and at the nozzles. Too often the pressure is too low for good work, and the spray too coarse, and a good number of the fruits on a tree sprayed on one side only, if touched at all.

The prices obtained for apples and pears in the Colony are still so high that fruit growers here can well afford to take the trouble that is out of the question in America. In few other countries are thorough measures against the insect more profitable than here. Of course, the arsenical which is most recommended is ready prepared paste arsenate of lead.

Mr. Lounsbury in conclusion also mentioned other matters, such as the suggestion for legislation to compel fruit-growers to deal with these pests, but he stated that this would be useless unless backed by public opinion, and then if so backed almost needless, while a great expense. He also traced the history of the fruit fly, which was discovered in East India in 1826, and latterly spread all over the fruit-growing world. A Brazilian parasite had been discovered which, it was hoped, would arrest its progress, but the hope was thoroughly shattered by the investigations made by him a year ago. He also dealt with varieties of scale insects.

CO-OPERATION IN AGRICULTURE.

The Wool and Mohair Industries.

Organising Work to Date.

Further Extracts from the Report of Mr. P. J. HANNON,
Superintendent of Agricultural Co-operation.

As promised last month we now publish further extracts from the report of Mr. P. J. Hannon, Superintendent of Agricultural Co-operation, which are of great interest to those engaged in the Wool and Mohair Industries particularly. Mr. Hannon thus deals with

THE WOOL INDUSTRY.

The necessity of devoting the best energies of our farmers to the improvement of their clips of wool throughout the Colony engaged our constant attention during our trip. The result was that the Minister decided to submit the question to a Congress representative of the farmers and the commercial interests involved, with the object of formulating some practical policy. The conference took place at Port Elizabeth on the 26th and 27th of January and was largely attended. An unfortunate impression seemed to prevail in the minds of the trading community that it was the intention of the Government to create co-operative organisations to deal direct with English manufacturers in the disposal of Cape wools and mohairs. This, of course, was absurd, and no justification ever existed for such a view. After prolonged discussion the Congress decided to adopt an outline of a constitution for an organisation to be called the "National Association of Wool and Mohair Growers," and it further agreed to a set of recommendations to be issued to farmers, through their local associations, having reference to the shearing, grading and classification of wools. Following upon the Congress a number of meetings were called in different districts, and branch associations are rapidly in course of formation. The Executive Committee, appointed at Port Elizabeth, met at Kimberley on the 15th May, and certain modifications in the original rules of the Association, and also in

the recommendations to farmers in dealing with wools, were agreed to. During my visit to England I was constantly in touch with the principal manufacturers and wool brokers, and endeavoured, as far as possible, to bring together a valuable body of opinion from the point of view of the trade in England, which might help us with the work of organisation here. While in England I submitted a series of questions to the London Wool brokers, and these were further referred to Alderman Moore, of Huddersfield, who was recently employed by the Orange River Colony Government, and who is regarded as one of the most thoroughly competent experts on all questions affecting wools in England. These questions, with their answers and Mr. Moore's remarks, are included herewith. Mr. Moore has, indeed, been especially generous in his assistance to my investigations in connection with our wool trade, and has written me a valuable letter which, inserted hereafter in this Report, I suggest, deserves the most careful thought on the part of the farmers of this Colony.

RULES OF THE NATIONAL ASSOCIATION OF WOOL, MOHAIR, AND
FEATHER GROWERS, ADOPTED AT THE KIMBERLEY CONFERENCE
ON MAY 15, 1906.

1. The title of the Association shall be "The National Association of Wool, Mohair, and Feather Growers of the Colony of the Cape of Good Hope."

2. The central offices of the Society shall be at such place in the Cape of Good Hope as shall be decided at some future date.

3. The objects of the Society shall be—

- (a) The improvement of the breeds of wool-producing sheep of the Colony in accordance with such suggestions as may be made by General Meetings from time to time.
- (b) The introduction of organised methods in the preparation of wool, etc., for the market.
- (c) The establishment of organized methods in the disposal of farmers' wools, etc., under a National Brand. That each District shall submit their District Brand to the Association for approval. That the National Brand be the words "Good Hope" in a crescent, but that its application be postponed for the present.
- (d) The circulation among sheep farmers of the Colony of such information as may be of use to them in the development of this industry.
- (e) The acquirement of such property as may be necessary for the purposes of the Association, and making such financial arrangements with banking companies or others as may be essential. The liability of each member shall not extend beyond the transactions of his own Branch Association.

It shall be lawful for the Society to do these and all other things necessary for the discharge of the purposes for which it is established.

4. The Society shall be composed of members being *bona fide* farmers in the Colony, and such other persons as general meetings may approve of from time to time.

5. The Association shall be composed of branches operating in the Colony, provided that any farmer living in any Fiscal Division may elect to be a member of one or other of the Associations formed. Such branches shall have local committees, composed of a chairman and such number as may be approved of by the local branch. Local branches may make such rules as are specially suitable to their requirements, provided these rules do not violate the constitution of the Association.

6. Each branch shall elect one member to represent it on the Council of the Association, but additional representation should be granted upon the basis of registered membership up to 50, one member—over 50, two members.

7. The Council so composed shall elect from its members an Executive Committee of 23 members to correspond with the representation in the Legislative Council.

8. The Association shall be a non-political body, and no question may be brought forward, or discussion introduced, of a political, sectarian or extraneous character.

9. The period of office of the Council shall be 12 months.

10. The Executive Committee shall hold office for such period, and retire in such manner as may be decided by the Council.

11. The Executive Committee shall have power to appoint a Secretary and such other officers as may be approved of as necessary for the discharge of the functions of the Association.

12. Associations shall have the right to fix a charge on their individual members, but each local Association shall contribute to the funds of the Council a sum equal to 5/- for each member on its own roll.

13. All officers having charge of the receipt or payment of any moneys of the Federation shall give such security as may be approved of by the Executive Committee.

14. The Executive Committee shall meet at such times as may be rendered necessary, due and sufficient notice having been given. The first meeting to be called at the instance of the Chairman, as he may think fit.

15. The meetings of the Council shall be annual.

16. The rules and bye-laws of the Association can be altered by any special meeting of the Council, one month's notice at least being given to all branches of such proposed alterations.

17. Every member guarantees that the class marked on the outside of any bale bearing his name, the name of his farm, and the District Brand, is a true description of the contents of the bale, according to the mode of classification adopted and published by the Association.

18. Any wool showing traces of scab should not bear the District Brand.

19. Every Branch Association shall have the right to dispose of its own wool as it may think proper.

20. Any member knowingly and willingly breaking any of the rules shall be liable to expulsion by the Executive of the Local Branch.

RECOMMENDATIONS FOR SHEARING, CLASSING AND BALING WOOLS.

1. A proper shearing shed should be provided, suitable, of course, to the special circumstances of the farm. The shed should consist of a shearing board extending along one side, the remainder being occupied with catching pens and a walking space along which the sheep may be driven to the pens. The floor of the shed should be slightly raised, and slope of the shearing board in the direction of the sheep walk, so that urine and droppings may be easily removed. Openings might be provided in the shed off the shearing board into a small yard for shorn sheep.

2. Shearing must be done as quickly, quietly and gently as possible. Pick out all the stained wool from the wethers. Belly wool should be placed in separate bags. The shearer then commences on the neck, from the brisket to the head. Wool must be broken open and not cut at the neck. Second cuts must be avoided as much as possible as this makes uneven lengths of staple. The fleece shall then be shorn off in one whole piece, and not on any account broken or torn. The points and shanks to be attended to first. The whole fleece is then carried on to the wool table.

3. The wool table is constructed of rollers or batters placed about half an inch apart. In the more modern table, rollers set from side to side instead of from end to end of table, take the place of those batters, and they are found to be superior in every way. A table should be about 10 feet by 5 feet, and can be made on the farm. In the case of angora goats, netting should be used.

4. The fleece rests on the tables, right side down. Edges having grass seed, burr or soiled wool should be removed, leaving the fleece free from any soiled parts.

5. Rolling takes place by throwing in one side about 1/3, then double over again about 1/3 when the near edges are turned in, the neck being next doubled over. The fleece is then rolled from the breech to the shoulder, leaving all the best wool exposed to view.

6. Fleeces must not be tied in any way whatever, but when rolled are conveyed at once to the classer's table.

7. The classer, from inspection of the sheep beforehand and from experience, knows the exact type of wool, whether long or short, coarse or fine, and selects accordingly.

8. Classing should be as simple as possible, and no complicated scheme should be attempted with small flocks. Generally speaking, the following will suffice. Wool:—(a) long, (b) short, (c) weak and dingy fleeces, and (d) coloured. Mohair:—(L.F.) The usual summer clip. (Kids) the usual first clipping from kids. (K.W.) The second shearing after kids. (W.) The usual clip grown between June and November. (I.K.S.) All stained and dirty hair.

9. The fleeces as selected by the classer should be taken out of their separate bins and packed in tiers in the bale. Rolled fleeces should be handled carefully to avoid loosening or breaking. When baling the fleeces, the bales on no account should be cut, and loose string or twine should not be allowed to get into the bales. Lining the bales with light dust-proof cloth is recommended. When properly pressed the bale is neatly sewn up.

10. The bales must be branded as clearly and neatly as possible. The name of the district in large block letters, and marks indicating the district association and the farmer's name must be affixed. The brand should be stamped on one side and one end of the bale. Besides the brand and reference numbers and the farmer's name, the bales should be marked "Wethers," "Hoggets," "Ewes," "Lambs," etc.

11. After skirting, the pieces should be placed on the table. "First pieces" are those perfectly clear of points and dirty edges. "Seconds" are the skirtings of the first pieces. These are placed in separate bales and branded "First Pieces" and "Second Pieces." Locks and small dirty points, second cuts, and fragments which have fallen under the table are baled separately and branded "Locks." The dags which remain should have the wool cut off. This does not apply to Angora goats.

12. Inferior wools must not bear the District Brand, but merely a mark indicating the contents.

13. Generally speaking, the weight of the bales should not exceed from 250 to 400 lbs., according to the district in which the wool is grown. The wool not to be pressed too tightly. Mohair not to exceed 600 lbs.

14. Each district association should have one or two wool presses which might be passed from farm to farm during the shearing season, and would be of great value in neat baling.

15. Bales should be made up from clean light jute fibre not exceeding 10 lbs. weight.

16. The following recommendations are also advisable:—

(a) In branding sheep avoid tar and mixtures injurious to wool.

(b) Kraals for shedding during shearing should, as far as possible, be latticed.

A well-grown six months' wool will be accepted as eligible for the brand, but must be marked with the words "six months."

Questions submitted to Wool-brokers in London, with replies and opinion of Expert thereon:—

Questions.	Mr. Moore's Opinion.	Wool Brokers' Remarks.
1. What is the sorting usually made by home and foreign buyers respectively with regard to Cape wools?	Entirely depends upon the use to be made of it; if the bellies, necks and pieces off the legs are removed and packed separately at time of shearing, no more is needed from the grower.	Quite agree.
2. How many bales of wool of the same class would be regarded as a fair minimum in buying?	10 bales fleece, 4 pieces and bellies.	do.
3. What marks would it be desirable to have on the bales, such as "combing," "ewes," "clothing," etc.?	Farmer's name and District, and "fleece," "pieces," "bellies," or other descriptions of contents. Thus: J. Smith, Craddock, Cape Colony. Fleece.	do.

<i>Questions.</i>	<i>Mr. Moore's Opinion.</i>	<i>Wool Brokers' Remarks.</i>
4. Are Cape scoured wools rescoured at home?	Not if clean scoured in Colony, unless required for combing, which is done whilst wool is wet.	Quite agree.
5. Are Home buyers in favour of Cape Wools of good quality being scoured in the Colony or only low grade wools?	Long wool, no; short wool, yes. All wool yielding less than 40 per cent. might with advantage be Colonial scoured.	We think Mr. Moore puts the yield a little high. In our opinion, wools yielding less than 36 per cent. might with advantage be scoured.
6. How far do you recommend the skirting of mohair?		If the dockings are removed from the fleece, we think the requirements of the Trade in this respect are quite satisfied.
7. Does the fibre of wools from Cape Colony shew any special defects as compared with Australian fibre?	The best Cape is inferior to the best Australian, and so is the worst, but the best Cape is superior to the worst Australian. Generally speaking, Cape wool shews that growers have not made such a science of wool growing as the Australians.	In addition, we would say that Cape wools generally never have quite the soft silky feel which is so characteristic of the Australian growth, and therefore does not spin so fine.
8. Would a uniform method of rolling fleeces assist the sorters in any way, or can any suggestion be made under this head?	Yes, they should be rolled in the Australian fashion. The shoulders which carry the best wool will then be first seen.	Quite agree.
9. Is there much kemp shewn in Cape wools?	More than in any other Colonial wool—thanks to Africauder blood in some flocks.	do.
10. Does the stained wool by urine scour quite white?	No—and therefore stained wool should never be packed with fleece.	do.
11. Does the present mode of getting up Cape wools damage good wool that otherwise would fetch a higher price?	Yes, badly skirted wools always suffer in a weak market.	Those under-skirted badly-got-up wools are always the first to feel the fall in the market and the last to feel the rise. Again, the yield in such parcels is always deceptive, and the buyer takes very good care that he is on the right side with his valuations.

To the courtesy of the Chambers of Commerce and others, I am able to present the following notes from various sources on the views entertained with regard to South African wools and the suggestions more generally urged in the direction of their improvement:—

Messrs. Schwartze & Co. return the world's supply of wool for the year 1904 at 2,129,000,000 lbs.

It is interesting to note the proportions in which this was contributed by various countries.

		Per Cent.	Per Cent.
The United Kingdom supplied..	..	6.20	
Continent of Europe (excluding Balkan Peninsula)	..	21.14	
North America ..	..	14.33	
Total, Europe and America	..		41.67
Australasia supplied	..	24.11	
South Africa supplied	..	3.35	
South America supplied—			
		Per Cent.	
River Plate ..	..	20.86	
West Coast ..	..	.60	
Falkland Islands	..	.14	
Punta Arenas ..	..	.63	
			22.23
Other Sorts—			
Turkey, North Africa, Persia, Asiatic			
Russia ..	..	3.30	
East India, etc. ..	..	2.05	
China ..	..	.85	
Alpaca, Mohair, Camel's Hair and			
Sundries ..	..	2.44	
		8.64	58.33
Total Imports	..		100.00

In connection with the foregoing figures, there are three striking features:—

- (1) The large proportion, 41.67 per cent., supplied by the manufacturing countries themselves.
- (2) The immense quantity, nearly 45 per cent., contributed by Australasia and the River Plate, and
- (3) The smallness of the quantity, 3.35 per cent., received from South Africa

The production of the United Kingdom is gradually but surely diminishing. The old sheep walks on the moors and uplands are year by year becoming more and more enclosed or devoted to the preservation of game. The large importations of frozen meat from New Zealand and the Argentine make sheep-rearing at home for the purposes of food less profitable. Add to these reasons the natural extension of the large towns into the adjoining country districts, and it is easy to be seen that the rearing of sheep, to whom quietness and solitude are almost as essential as food and water, is obliged to become year by year of less importance.

The continent of Europe has shewn little alteration for thirty years back. The same influences which are at work in the United Kingdom operate in some districts, but they are compensated for by increased attention to sheep rearing in others. It may, however, be accepted that Europe is not likely to increase its home supplies, and that any change will probably be the other way.

North America is a vast continent, and one might reasonably expect that it has by no means reached the maximum of possibility as a wool-producing country. But the fact remains that it shows no tendency to increase its home supplies, notwithstanding the high protective duty enjoyed by the United States farmers, and year by year the American manufacturers are becoming larger and larger customers for Australia and the River Plate.

Australia has just emerged from the most severe and protracted drought which has ever visited that continent. In nine years the number of sheep diminished from 101 millions to 54 millions.

Adversity always carries its own lessons with it, and the Australians are not the people to suffer without applying the experience gained to their ultimate advantage.

We shall see large increases from Australia during the next few years, and there is no reason to hope that the increase will be more stable and less liable to be affected by drought to the extent already suffered.

In the Argentine, the raising of corn and breeding of cattle are supplanting sheep

in some of the best districts, but developments are still expected in the districts which devote themselves to the frozen meat industry so that the probabilities are that cross-bred wool from that country will show a further expansion, but those who are best informed do not anticipate any further increase in merinos.

Then it is to South Africa—after Australia—that those interested in fine wool must look for that expansion of the industry which is necessary if the machinery of the world is to be kept supplied.

There never has been, and never can be, too much wool produced. The quantity may affect the price, but low prices always produce two results; the producer economises the cost of production, and cheap goods stimulate the demand.

By the time the improved demand effects the logical sequence of sending up prices, the grower is in a position from the economies he has put into practice to reap the full advantage and pocket increased profits.

The quantity of clean wool consumed per head of population in Europe and America last year was 2½ lbs. In 1895, which was the record year of production, it was 2·91 lbs. Half a pound per head means about one million bales of Cape wool, so no anxiety need be felt by farmers on the score of over-production.

MR. MOORE'S LETTER.

Dundas Street, Huddersfield,
April 6th, 1906.

MOORE BROS., Wool*Merchants.

Dear Mr. HANNON,

In answer to your enquiry I have formed a very good opinion of the pastoral possibilities of South Africa, and see no reason why its production of wool should not both increase in quantity and improve in quality. I know no man who better deserved every farthing of return that his industry will produce than the South African farmer, but in his desire to get as much as possible he has been too prone to overlook some of the fundamental principles which make for success in any calling. I will endeavour to briefly set out the points in which I think reform would be attended with increased profit to the farmer, more satisfaction to the user, and certainly more credit to the South African Colonies.

Instead of aiming to make the wool as heavy as possible, it should be marketed as light in grease as the dust storms and natural conditions of the veld will allow. Hitherto the farmer has been under the suspicion of tainting because he sold the dirt with the wool that is paid him to put as much in as possible. Every buyer buys on the clean value.

If the wool is worth 2s.—clean, it means 1s. for 50 % yield.

"	"	"	10½d.	"	45 %	"
"	"	"	9½d.	"	40 %	"
"	"	"	8½d.	"	35 %	"
"	"	"	7d.	"	30 %	"
"	"	"	6d.	"	25 %	"

The determining factor in fixing the value, no matter in what market the wool be sold, is the price which the user can pay delivered at his mill. As all users are in the Northern Hemisphere it means that freight has to be paid on the dirt as well as on the wool from South Africa to Europe or America. Let us see how this works out. Assume that it costs the farmer ½d. per lb. to send the wool from his farm to East London, Port Elizabeth, or Cape Town, and that another penny is required to pay all the charges of shipment and freight to Europe, or total charges, 1½d. per lb. On a wool wasting 50 per cent., it would mean 3d. per clean lb. in charges, but on wool yielding only 25 per cent. it would mean 6d. per clean lb. Who pays this? The farmer without doubt, because if he sells his wool on his own farm the price he receives is based on the value in Europe, less every charge incurred in delivering the wool there. Therefore, the lighter the wool the more per lb. the farmer receives, and the loss is deducted from the buyer's valuation on account of freight on the dirt which is no use to him. How is the farmer to make his wool lighter?

- (1) Return to the honest methods of his fathers, and cease to deliberately pack veld with the wool. South African wool averages 10 per cent. more waste to-day than 25 years ago.
- (2) Shear on a clean wooden or concrete floor instead of in a dirty kraal.
- (3) Keep the manure (mest) which clings to the nether end of the sheep at home.
- (4) Pack the bellies, neck and leg pieces separate from the fleeces.

- (5) Shear once only in twelve months; long wool is not only more valuable, but it usually contains a less proportion of veld than short wool.
- (6) Shear in October or November instead of waiting until the summer heat has caused increased grease through perspiration. Nature demands that the sheep should have at least covering when the weather is hottest.
- (7) Endeavour to get greater density in the fleece. A dense fleece offers resistance to the penetration of dust, and the bulk of the waste will be found within half an inch of the tip of the staple.

I am aware of the partiality of the South African farmer to Africander mutton. If mutton only is wanted, the Africander is good enough, but don't attempt to cross the Africander with any other breed under the impression that a good wool can be produced. The Africander or Persian wool is comparatively valueless and where such sheep are kept for meat purposes they should on no account be allowed to cross with any other breed, and their wool should never be mixed with that of any other sheep. The hairiness and kemps peculiar to Africander and Persians is fatal to their wool ever being of much value.

From the little I have seen of Cape Colony and Natal I think it would not be difficult to find a cross between the Merino and say Shropshire, Leicester, Wensleydale or some other heavy English breed which would be as good as the Africander for meat purposes and whose wool at the same time would be valuable. Such sheep require rich pasturage and to attempt the cross on land which would only carry a sheep to the morrow, would probably be to court disaster. In some of the richer districts of the O.R.C. I saw some excellent results of the Shropshire-Merino crosses, and Wensleydale-Merino crosses.

South Africa is admirably adapted for growing fine soft wool with good spinning properties. Australia is in my judgment making a mistake in going in too freely for the Vermont breed, thereby producing a wool less soft than the pure Merino, more irregular in quality and less adapted for fine spinning. Some of the best spinners now look more to the Western Province of Cape Colony for their wool than to Australia. Australia's mistake is South Africa's opportunity, and if its farmers will practise the same care in breeding only from high class stock that the squatters of Australia exercise, they will soon make their position secure. Mention of the Western Province and its excellent wool reminds me to again emphasize the especial necessity to its farmers to take to heart my previous remarks about sending the wool away as light in grease as possible. The long combing wools from this District are admirably adapted for American requirements - for mixing with and improving the harsh Vermont bred wools of their own country. But inasmuch as all greasy wool imported into the United States pays an import duty of 11 cents per lb., it will readily be seen that the cute Yankee will not pay duty on dirt, so he imports only the lightest possible greasy wool yielding 50 per cent. or over after scouring. A little more care and attention to the rules here laid down would bring many of the Western Province wools into this category, but hitherto they have not participated in the benefits of American competition simply on account of their heaviness. Any wool suitable for America often realizes a 1d., sometimes even 2d., per lb. more than European buyers can afford to pay.

Your query about scouring wool in the Colony in preference to shipping in the greasy state is not easy to answer on general lines, but I think a few broad principles may be laid down which will assist the farmers in deciding for themselves what course to adopt. The chief reason for scouring is to save carriage or freight on the dirt. If scouring is decided upon, it must be entrusted to some respectable commission scourer, as if the farmer attempts it in his own dam it is a thousand to one he will spoil it. Expert knowledge and skill are required. In the neighbourhood of Paarl and Uitenhage are commission scourers who understand their business thoroughly—the best scoured wool seen in London comes from those works. For carding purposes this scoured wool is fit to go straightaway on to the machines or into the dye-pan, but for combing the wool must be slightly wet. Therefore the arguments in favour of scouring are much stronger in the case of short wools which are suitable only for carding than with longer wools adapted for combing. As a general rule it will be found an advantage to

Ship in the Greasy State

all wool with an average staple of two inches or over, which will yield after scouring 36 per cent. or over.

All wool shorter than two inches staple which will yield after scouring 42 per cent. or over.

All very burry or seedy wool.

SCOUR.

All wool wasting 60 per cent. or more unless very faulty.

As I said before the saving of carriage is the paramount factor, but even that should not be allowed to weigh in the case of long wool yielding 50 per cent. which should be shipped in grease in the hope that it will attract the eye of an American buyer.

At all times I shall be glad upon receipt of a fairly representative sample of say about 2 lbs. to express (without charge) an opinion which would be a guide for future years as to whether a clip should be scoured or not. I hope it is unnecessary to add I shall be glad to advise upon any matter or to assist the Government in any way in my power in the praiseworthy efforts they are making to get for the farmer all the benefits which will inevitably accrue from the more intelligent handling of his produce. I shall cherish the pleasantest recollections of the kindness shown to me as a member of the British Association whilst in South Africa, and shall welcome any opportunity to repay it.

Faithfully Yours,

(Sgnd.) T. H. MOORE.

P. J. HANNON, Esq.,
Cape Government Offices,
102, Victoria Street,
London, S.W.

PREPARING THE WOOL FOR MARKET.

Notes by Mr. Moore and others.

There is no other country where the bad practice of shearing twice a year prevails to the extent prevalent in South Africa. It ought to be the aim of every grower of merino wool to produce a staple as long as possible. For every buyer of short merino wool there are at least six buyers of long wool of the same quality. The reason for this is, that the long wool is available for combing purposes, whilst the short wool is restricted to the clothing market, and whilst it is possible for the clothing trade to use the long wool, in fact, a certain proportion of long wool is essential when shoddy and other wool substitutes are used, the comb cannot profitably handle the short wool.

Therefore you may take it that long wool is worth from a penny to two pence per pound more than short wool of the same quality.

Suppose a man has a flock of one hundred sheep and he shears half the number each six months, the other half at the end of twelve months, the account would stand something like this:—

6 Months' Wool.				12 Months' Wool.			
250							
250—500 lbs. at 7d. ...	£14	11	8	500 lbs. at 8½d. ...	£17	14	2
Less cost of twice				Less cost of shear-			
shearing ...	2	0	0	ing ...	1	0	0
	<hr/>				<hr/>		
	£12	11	8		£16	14	2

Difference in favour of 12 months, £4 2s. 6d.

Everyone who knows anything of shearing knows that the shearer's wages are not the only expense at that busy time, but other savings may be put as a set-off against having to wait six months longer before realizing one half the clip. There may be arguments to be advanced from the farmer's point of view in favour of the half yearly shearing, but they will need to be very weighty indeed to outbalance the very obvious commercial drawbacks of of such a course.

Mr. S. B. Hollings, in reviewing my campaign in Yorkshire on behalf of Cape wools and mohairs, makes the following observations :—

MOHAIR.

I applied at the Board of Trade for information relative to the imports and re-exports of South African and Turkish mohairs. I regret that the Board was unable to give me any information of the average prices of South African mohairs or of the quantities received and re-exported. I was supplied with the following average prices for Turkey average mohair as follows : 1903—14d. ; 1904—16d. ; 1905—15½d. The bulk of mohair exported from the United Kingdom is shipped to the United States. The declared value of the total re-exports in 1905 was £155,305, of which £153,654 represents the value of the re-exports to the United States.

The general feeling in manufacturing circles in Yorkshire is that Cape mohair is improving from year to year, and during the past season the Cape article, taken generally, was regarded as superior to Turkish ; and, as a matter of fact, frequently fetched a larger price. It behoves the Cape farmer, in those districts peculiarly suitable to the Angora goat, to leave nothing undone to improve the character of our mohair exports, and the work already done by the body of gentlemen who specially represent mohair on the National Association of Wool and Mohair Growers, gives good earnest of a successful future.

SUMMARY OF ORGANISING WORK DONE UP TO DATE OF THIS REPORT.

Since the advent of the co-operative movement in this Colony nearly 60 districts have shewn promise of undertaking schemes connected with various branches of farming in the direction of giving practical effect to the principles which have been placed before the farmers of the country by the Government. It will, of course, be understood that co-operation in agriculture, which it has taken nearly 25 years to build up in Europe, and from six to ten years in the other great British Colonies, cannot realise very great results in the course of a few months. The attitude of the people of the country towards the movement is, however, more hopeful

than has been the case in any agricultural community with which I am acquainted. As far as possible, the special economic conditions of each district have been carefully considered, and only projects suitable to existing possibilities have been suggested. Numbers of enquiries from various points in the Colony are being received at the Agricultural Department daily, and wherever practical efforts are being made by groups of farmers, every help and encouragement is being extended to them.

The following schemes have been approved of by the Government as eligible for loans under Act 43 of 1905 :

- (1) *Stellenbosch Co-operative Winery, Ltd.*—The capital of this Society has been fixed at £10,000, of which £5,000 are being kept in reserve to be allocated as future members make application and are accepted. The membership at present is seven, and the quantity of wine made during the past season is approximately 170 leaguers. The Society has acquired an excellent site upon which very substantial buildings on the most modern lines have been erected, and the latest type of cellarage equipment has been provided, capable of accommodating in the aggregate 600 leaguers of wine.
- (2) *Darling Co-operative Dairy Society, Ltd.*—The creamery business which had been carried on at Darling for a number of years by Messrs. Müller and Thernstrom has been acquired by a Local Co-operative Association of farmers with a nominal capital of £5,000, upon which a first call of 2s. 6d. has been made. The membership of the Society consists of fifty-five farmers and the trade turnover for the current year is estimated at £8 000. The property having been transferred to the Society free of all encumbrance, and the first mortgage having been completed in favour of the Government, which applies to the uncalled share capital of the Society as well as to the land and buildings, it was agreed to advance the sum of £3,500. The creamery has already a sound business connection, and the high reputation of its butter is very well known. Much greater interest is now being taken in its success under the control of the people themselves, and the dairying industry in the locality is being very largely developed by the improvement of the breed of milch cows and by more careful attention being extended to the production of milk and butter.
- (3) *Klipheuwel Co-operative Society, Ltd.*—In this case the nominal capital is £3,500, upon which a first call of 2s. 6d. has been made, and advances have been made by the Government upon the usual conditions, amounting to £2,600. The creamery was only ready for work at the close of the milk season, and it was therefore decided not to commence operations until the opening of the forthcoming month of July. A manager has been secured, and a large supply of milk is expected.
- (4) *Wellington Co-operative Winery, Ltd.*—The membership of this Society consists of nine farmers; its nominal capital is £10,000; the first call of £1 per share has been made, and the total advances made by Government up to the present amount to £3,500. The total cost of land, buildings, and fustage amounts to £9 500, and accommodation is provided for 1,000 leaguers of wine. The entire concern has been constructed on the latest model, and the equipment has been carried out under the control of the Government viticultural expert. The winery was opened on the 27th February, 1906, and during the current season has dealt with grapes producing 400 leaguers of wine. This wine has already been disposed of through arrangements with the leading Cape Town wine merchants, the average price per leaguer being £1 more than that received by any wine farmer in the Wellington neighbourhood.
- (5) *Bedford and Cottesbrook Dairy Society, Ltd.*—This Dairy Company had been registered at Bedford for a considerable time, and for some years had had a large measure of success. During the past few seasons, owing to drought and bad management, its affairs became complicated, and after complete examination of its management and possibilities, it was decided to advance a sum of £5,000 upon first mortgage of the entire property, including

central creamery, with land and buildings at Bedford, creamery under lease at Cottesbrook, and distributing depot with pasteurising machinery held on lease at Port Elizabeth. The Government further stipulated that the capital of the Company should be reduced by £5,000, £3,000 of which was held by the Managing Director, and further, that this gentleman should forego all claims against the Society for salary said to be due to him during past years. The Society secured a new manager from Ireland, who until he accepted the position, was inspector and expert in the Irish Organisation Society, and one of the most competent creamery men in that country. There is every indication at present of a successful career for this concern.

- (6) *Adelaide Co-operative Creamery Company, Ltd.*—This concern is one of the best designed and equipped creameries in South Africa, having been erected under the supervision of its present manager, an experienced Danish dairy expert. It was found, in consequence of drought and certain difficulties in local organization, supplies had fallen off, and it was necessary to re-organize the entire project. After our public meeting, an exhaustive investigation of the Society's affairs was made, and the value of its property ascertained. Certain suggestions for re-organization having been accepted by the Directors, and all the conditions imposed by the Government to secure the future success of the Society, having been complied with, it was decided to make an advance not exceeding £8,000. Since re-organization, the business of the Society has been very largely increased, and at the close of the month of April nearly 30,000 lbs. of butter were in cold storage. This is now being profitably disposed of, and the greatest satisfaction prevails in the locality with reference to the utility of the creamery to the people. In the re-organization scheme a large number of additional districts have been brought in as suppliers, and cream is now being received from points as far remote as Cradock; Somerset East and Alice having been made regular collecting stations. The Directors report that the dairying industry is being largely developed among the farmers generally in consequence of the new scheme of working adopted.
- (7) *Bankers Park Co-operative Creamery, Ltd.*—The condition of affairs in this company was somewhat similar to the two preceding ones. Complete re-organization has taken place, the strictest conditions have been imposed by the Government with regard to the management of the concern; and a sum of £5,000 has been advanced. Butter from this creamery is now being sold in the Cape District, and is regarded by experts as the finest butter produced in the Colony.
- (8) *The Western Province Preserving Company* comprises a number of fruit growers in the district adjoining Hex River, and is established for the purpose of dealing on the most modern lines with the scientific canning and preserving of fruit. During the past season a very large business has been done, and the Society has been sufficiently enterprising to secure the services of a Californian expert as an annual salary of £750 per annum. In view of the great possibilities of this industry in the Colony, and having regard to the measure of self-help put forth by the farmers of the Hex River Valley and neighbouring districts, the Government felt justified in making two separate advances of £1,000 each; the first upon mortgage of the entire property of the company, and the second upon the joint and several security of the Directors.

Several applications presented in connection with schemes which, in the opinion of the Government, were not perfectly sound from a business point of view, and from districts in which there was no satisfactory evidence of real co-operation being brought into play, were refused.

|| The following schemes are under consideration, and will probably be completed during the ensuing six months:—

- (1) The purchase of the Perthshire Company's business at Salt River by a Co-operative Society composed of dairy farmers in the Sir Lowry Pass, Eerste River, Stellenbosch, Bellville and Cape Flats Districts. The Directors of this Company have agreed to sell the whole of their property

for £5,000 and the provisional Committee representing the farmers have agreed to accept the offer. An examination of the business with its possible future development, has been made at the instance of the Government, and, if the conditions laid down are complied with, a loan equal to the above-named sum will be advanced. The principal conditions are that the nominal capital in the Co-operative Society must be £5,000, to be taken out by the farmers themselves, and that a first mortgage must be completed to Government. It is obvious that the acquisition of this business will be much more satisfactory from the farmers' and consumers' point of view than if, as was contemplated, a second rival milk-distributing depôt were established in Cape Town. The formation of this Society is particularly interesting in view of the decision of the new Society to take every precaution to supply pure, fresh milk and pastourised milk to the city at a fair price, and with every regard to considerations affecting public health.

- (2) The farmers in the Malmesbury District contemplated the establishment of a creamery, and a local Committee is at present canvassing with a view to determining the approximate number of milch cows available for its support.
- (3) The Darling Co-operative Society has made application for assistance in the erection of sheds for the storing of grain and the purchase of machinery for chaffing and compressing fodder. This scheme is at present in process of organization.
- (4) A proposal was made by the Piquetberg farmers to purchase the grain mills owned by Messrs. Liebenberg Bros., for the purpose of being run on co-operative lines, with additional facilities for the storage of grain and fodder. The proposal has received a considerable measure of support, but on account of local difficulties, has been dropped for the present season. It is believed that the next effort will be successful.
- (5) The Wellington dairy farmers have established a co-operative dairy society, and their creamery buildings are now complete. Application has been made to Government for a loan on the usual conditions and a sum of £500 has been sanctioned and advanced. The membership is about 30 and the number of cows at present available for the purposes of the Society exceeds 1,000.
- (6) In the Tulbagh District a co-operative winery is projected, and probably also other forms of co-operative effort will be possible, and it is intimated that an application will be made for a Government loan.
- (7) Co-operative projects having reference to wine, fruit and dairying are in contemplation in the Worcester, Robertson, Montague and George Districts.
- (8) At Graaff-Reinet, Cradock, and Grahamstown, proposed societies to deal with dairying and the collection and distribution of fruit are in consideration.
- (9) In the East London, Kei Road, Komgha, and Stutterheim Districts, creameries are being considered in connection with a milk-distributing depôt at East London.
- (10) The local committees at Cathcart and Moltene have hope that creameries will successfully be established, especially at the latter place. Plans and specifications have been under consideration at Moltene, and as soon as the matter can be attended to from the Department, there will be very little delay in putting the project into shape.
- (11) At Aliwal North the local committee proposed to purchase the premises of the Imperial Cold Storage Company to be used as a creamery, but the latter body declined to sell. The Committee is now endeavouring to secure a site upon which a co-operative dairy may be erected.
- (12) At Dordrecht a nominal capital of £2,000 was provisionally subscribed towards the erection of a creamery, but the matter has been in abeyance during my absence from the Colony. The scheme will now be taken up energetically.
- (13) At Vryburg a syndicate of farmers was formed to carry out a scheme of co-operative fencing, but the Minister declining to sanction loans except in the case of jackal-proof fences the scheme is in abeyance. It is again being taken up with a view to a better understanding being come to between the Department and the farmers concerned. Other districts have made similar applications.

- (14) At Barkly East and Ugie the extension of dairying is being pushed forward by the local committee,
- (15) Farmers of Modder River propose the establishment of a syndicate for the purchase of machinery for pumping and irrigation purposes along the Modder.
- (16) At Ceres Road, Porterville Road and Herman, milk collecting stations will probably be erected in connection with the Wellington winery.
- (17) A boring syndicate has been organised at Pokwani, and the scheme is practically complete, Government having agreed to advance a sum equal to two-thirds of the cost of the boring apparatus. In the same district application has been received for a pasteurized milk station in connection with the forwarding of milk to Kimberley and Johannesburg.
- (18) The farmers in the neighbourhood of Elsenburg are anxious to have a co-operative winery, and a series of meetings have been held.
- (19) A scheme is under consideration for the more extended development of the Wellington Fruit Farmers Association, in connection with which an application will probably be made to Government for a loan.

Various applications have been received with reference to advances to groups of farmers for irrigation, water boring, and fencing, but there has not been sufficient time to have them properly dealt with.

The greatest care is being taken that every advance made is only sanctioned when the farmers themselves have taken the fullest measure of responsibility for the success of the society in which they are interested, and it is considered advisable to proceed rather slowly at first with the establishment of a small number of perfectly sound undertakings rather than encourage a large number, the success of which might not be warranted by the agricultural conditions of particular localities.

CO-OPERATIVE SOCIETIES UNDER THE COMPANY'S ACT, 1892.

It will easily be understood that the formation of voluntary associations with corporate capacity, for business purposes, by groups of farmers or other producers, must be regarded from an altogether different standpoint from the flotation of an ordinary limited liability company. This has been recognised everywhere, and special legislation has been adopted to facilitate the organization of such associations. The best example that may be quoted is the "Industrial and Provident Societies Act, 1893" (England) which was placed upon the Statute book for the specific purpose of affording greater facilities for the development of organised effort among artisans, agriculturists, and working people generally to secure a legal status at a minimum expense, and with as little formality as possible.

The supervision of societies established under the provisions of this Act, has been entrusted to a special officer, the Registrar of Friendly Societies, to whom returns have to be regularly made, and who issues orders from time to time for the more efficient management of all such institutions. Model rules have been prepared by Government, no prospectus being issued, and registration is effected free of expense to the societies.

Briefly the privileges of such societies in Great Britain and Ireland are that in the case of any such association: Registration renders it a body corporate for which it may sue and be sued with perpetual succession and a common seal and with limited liability; and shall vest in the society all property for the time being vested in any person in trust for the society; and all legal proceedings pending by or against the trustees of any such society may be prosecuted by or against the society in his registered name without abatement. (Section 21).

The rules of the society shall bind the society and all members thereof and all persons claiming therefrom respectively to the same extent as if each member had subscribed his name and affixed his seal thereto, and there were contained in such rules a covenant, on the part of such member, his heirs, administrators, and assigns to conform thereto, subject to the provisions of this Act. (Section 22).

All moneys payable by a member to a registered society shall be a debt due from such member and shall be recoverable in the County Court of the district in which the registered office of the society is situate or in that of the district in which such member resides at the option of the society, and it shall have a lien on the shares of any member for any debt due to it by him, and may set off any sum credited to the member thereon in or towards the payment of such debt. (Section 23).

A registered society shall not be chargeable under the income tax acts unless it sells to persons not members thereof. A society need not limit its number of shares. (Section 24).

Easy facilities for transfer of property. (Section 25).

Proceedings on the debts of members simplified. (Section 26).

Simple provisions for intestacy. (Section 27).

Freedom from Probate Duty. (Section 28).

Powers to deal with property of insane members. (Section 29).

The decision of disputes by arbitration is provided for in Section 49, and generally the irritating and expensive procedure so frequently necessary under the Companies' Acts is dispensed with.

It is yet too soon to seek for special consideration for co-operative associations in this Colony, but it is to be hoped that with the growth of the movement, Parliament will recognise the importance of treating self-help associations on a different footing from the ordinary joint-stock enterprises.

APPOINTMENT OF COMMERCIAL AGENT.

In view of the urgency of bringing prominently before the consuming public the high quality of Colonial produce and affording farmers who have established co-operative associations every facility to market their produce in the most economical and profitable way, the Government decided to appoint a Commercial Agent for

the Cape Peninsula. This officer is preparing in the first instance an exhaustive report on the relative positions of imported and Colonial butter and other produce, and shall furnish a weekly report accompanied by such business suggestions from a trade point of view as may be useful to our productive societies in the preparation and forwarding of their produce. If desired, he shall visit any other centre in the Colony and make such enquiries and reports as the Secretary for Agriculture finds necessary. In general he is to be employed in any manner which the Government may direct tending to develop our local markets in the interests of Colonial products. The appointment is only for a period of twelve months and is entirely experimental, the object being to prove that market representation is an essential part of agricultural development.

EXTRA-TROPICAL FORESTRY.

Being Notes on Timber and other Trees cultivated in South Africa and in the Extra-Tropical Forests of other Countries.

By D. E. HUTCHINS, F.R. Met. Soc., Conservator of Forests,
Cape Town.

(Continued from page 375.)

CONSERVATION OF STABLE MANURE.

FRESH IS GENERALLY BETTER THAN OLD AND ALWAYS MORE
ECONOMICAL.

The prejudice in favour of well rotted or fermented stable manure seems happily passing away. To rot the manure well requires expense and watching, and always some loss. To rot the manure badly, or even to carefully rot it thoroughly, means the loss of half its fertilising value. The care of a large heap of manure is no light one. If it gets too dry it burns: if too wet there is leakage, and the loss of the most valuable part of the manure. With every precaution there is often a smell of Ammonia. This means sheer waste of Nitrogen. I have for some years now used stable manure quite fresh, and have never seen any evil effects. Fresh undiluted urine is, as we have seen, poisonous to plant life, but on the dung heap it seems to decompose and become harmless very soon. Most of the Nitrogen of urine occurs in the form of urea, and when fermented takes the form of Carbonate of Ammonia, a volatile gas which easily escapes. It is this that one smells, especially in old fashioned cobble stables where the urine soaks in between the stones and there ferments. It is sheer waste to have anything but an impermeable concrete floor to a stable, the concrete being protected on the surface by tiles or Blue-hard bricks. The floor of the stable should drain to a water-tight well, whence the urine can be baled out with a paraffine tin or bucket and thrown on to the dung-heap. Up-country where labour is cheaper than cement an unpaved stable may be used, and the earth of the floor renewed from time to time. Such earth forms a fine manurial dressing, but the labour of renewing the floor with earth may be heavy.

Old well-rotted dung has certainly a dark, rich look, but this appearance of richness is deceptive. Analysis tells a contrary tale. Half of its valuable constituent, its fixed Nitrogen, is gone.

In the words of Dr. Voelcker: "Direct experiments have shewn that 5 tons (British) of fresh farmyard manure are reduced to 4 tons (British) if allowed to lie till the straw is half rotten: 5 tons (British) of fresh farmyard manure are reduced to 3 tons if allowed to ferment till it becomes 'fat or cheesy': 5 tons of fresh farmyard manure are reduced to 2 or $2\frac{1}{2}$ tons if completely decomposed."

So much for the reduction in bulk, so far so good: but, unfortunately, with the reduction in bulk, has come an increase of water and the loss of half the Nitrogen. Bulk for bulk, in spite of the increase of water, well-rotted manure is rather stronger than fresh manure, but when that slight concentration is obtained at the cost of half the Nitrogen it is dearly bought.

"Chemical analysis has shewn that 5 tons (British) of common farmyard manure contain about 40 lbs. of Nitrogen, and that during fermentation in the first period 5 lbs. of Nitrogen are dissipated in the form of volatile Ammonia: in the second 10 lbs., in the third, 20 lbs. Completely decomposed common manure has thus lost about one-half of its most valuable constituent.

(*Manures and Manuring*, C. M. AIKMAN.)

Dr. Trabut after six years of experimenting in Algeria strongly advocates the employment of stable manure in a fresh state, as containing more Nitrogen and leading to a general increase of crops. (*Bul. Agric. d'Algerie*, 15th August, 1901.)

Professor W. F. Massey of the American Agricultural Department is equally an advocate of using stable manure fresh. He says: "Many of our friends still seem imbued with the old liking for well-rotted manure. . . . The place to rot the manure is the soil, where you have the soil to absorb everything." He advocates the use of manure applied to the surface and says that evaporation does not take away much more than the water, and that afterwards manure spread on the surface acts as a mulch. He gives an instance of his having successfully applied stable manure to the surface of a raw clay. He adds: "Last summer was the hottest and driest ever known here, but it was pleasant to see how things grew and flourished in that clay. I use all manure as a mulch either in garden or field. In the garden, after setting plants or planting seed, the manure is spread over the surface and left there to slightly work in during cultivation."

The *South Australian Journal of Agriculture* for February, 1900, also advocates the use of fresh stable manure as a top dressing, adding: "in our dry climate it is a mistake to plough the manure under deeply."

HOW TO MAKE THE MOST OF FARMYARD MANURE.

A precaution necessary to take with manure in South Africa is to store it, under cover, and sheltered from sun and rain. The manure shed should be in a place where water can be thrown on if necessary. A winter's rain near the coast may take nearly all the Nitrogen and Potash out of a heap of farmyard manure, and even

some of the Phosphate. Stable manure freely exposed to heavy rain followed by hot winds and sun will dry out to what is little better than vegetable fibre. That was my experience in the Cape Peninsula before I took to putting the stable manure under a roof. Now every forest station has got its manure shed. An iron roof over the dung heap will cost £2 or £3 and will repay its cost in two or three years.

Manure is wasting when one of two things happens:—

(1) The manure heap is too dry and gives forth a smell of ammonia.

(2) The manure heap is too wet and a black liquid runs out from the bottom.

At the 1904 Meeting of the British Association for the Advancement of Science, Dr. Sommerville gave some account of recent German experiments on the scientific conservation of farmyard manure. In order to prevent the loss of Nitrogen, experiments were conducted in which the farmyard manure was treated with Kainit, with Superphosphate, with Gypsum, and with Sulphuric acid. Kainit and Superphosphate increased the loss of Nitrogen. Gypsum in spite of all that has been written to the contrary was found to be worse than useless unless used in large quantity, and then the resulting compounds were largely insoluble and not satisfactory. Sulphuric acid was the most useful conservator of Nitrogen, but the cost was excessive, and there were other draw-backs. The nett result of all the experiments was that chemicals are practically worse than useless and that in order to preserve the Nitrogen in the manure it should be kept closely packed, either under the animals or in the dung-stead. "The general conclusion arrived at and clearly expressed by Pfeiffer, is that excessive loss in manure can be best avoided by storing it in a deep mass in a water-tight dung-stead placed in a well-shaded situation, in which the material is firmly compressed. The necessary compression can be secured in various ways, perhaps most conveniently and effectively by means of the treading of cattle. The use of a considerable proportion of moss-litter is strongly recommended. This substance not only absorbs and retains the liquids, but being acid, it fixes ammonia. In the absence of moss-litter, loamy soil rich in humus will prove a useful substitute.

Since these experiments were published, the forest animals, and there are as many as 60 mules and horses at some of the stations, are supplied with plenty of fresh forest litter and bedded clean, dry and warm, as in a kraal on their own droppings. The compacted mass of closely trodden dung and litter is not removed to the manure shed till it is two or three feet thick. There is now an entire absence of evil smelling odours and of those ammonical exhalations that were once so bad, occasionally causing a loss of eyesight in the case of animals standing day and night in the stable.

Scott-Elliott, "*Nature Studies*" states at £15,000,000 the yearly loss to Germany of not using stable manure fresh! He describes the bacteria which fix the free Nitrogen of the atmosphere and of

the other class of bacteria which return the fixed Nitrogen to the atmosphere he says :—

“ These other soil bacteria change Nitrates into free Nitrogen. They are specially abundant where Oxygen is kept out, as, for instance in manure heaps which have been kept too long. Races of bacteria soon develop in such heaps and work upon the decaying material turning the nitrogen compounds into free nitrogen. As manure is often stored for six months, this means a serious loss.”

The loss of these costly nitrogenous compounds is indeed serious. Ought we not to look on our precious farmyard manure as a perishable article, like milk, meat or fish and either use it fresh or look carefully to its preservation without loss. One would be glad to know more about these pestilent bacteria of the wrong sort that rob us of our hardly won Nitrates and in a few months destroy the labour of years in building up nitrogenous compounds from the free Nitrogen of the atmosphere.

HOW TO INCREASE THE SUPPLY OF FARMYARD MANURE.

I know of scarcely a forest station in which more farmyard manure is not wanted for crops, gardens, nurseries or special planting. Not only can the supply of manure be strengthened by the addition of Phosphates and Potash as well as husbanded by being put under shelter, kept closely packed, and used fresh, but the actual supply can be increased by using plenty of bedding.

It is always in the power of the Forester, following the practice of the German peasant, to increase the effective supply of farmyard manure by using plenty of litter for bedding. From time immemorial, the peasants in Germany have enjoyed certain rights enabling them to go into the forest and gather pine-chats and other forest litter. They put the litter under their animals, which are mostly stable-fed, and thus make manure of it. These rights when pushed to excess do the forest much harm by depriving it of its natural fertilisation from the fallen leaves. In some cases when they become destructive to the forest they have been redeemed ; but this cannot often be done on account of the expense, so highly do they value these rights to remove litter. Thus, cutting the rank vegetation in vleys or using the litter from the forest in moderation, the Forester can largely increase the supply of dung yielded by the mules or other transport animals. It can be still further increased by making a compost pit (see below under nurseries).

For manuring nurseries, the compost pit has been employed in the forest nurseries, with marked success for many years. Compost may also be used like bone dust or ashes, a handful being put in with each planted tree. It is particularly useful for trees such as Camphor, Cypress, Ash and Oak, that grow slowly at first and then run up heavy bills for weeding and cultivating. Compost is rich in Nitrogen and in this way supplies the element that the forest tree obtains in abundance in the forest soil, but which is deficient in the top soil exhausted by repeated burning.

The value both of farming and manure compost naturally depends largely on the litter used. Manure from a stable where straw is used is always in Cape Town valued more than where pine chats are used. Brackenfern is sometimes used as stable litter and furnishes a rich manure. Young fern has yielded a manure containing as much as 2.42 per cent. of Nitrogen and 0.60 of Phosphoric acid. This may be compared with the following sample of an average farm-yard manure made with wheat straw in Europe.

Analyses of Stable Manure, made with Wheat Straw (by Bernard Dyer, B. Sc.)

				Per cent.
Total Nitrogen	...	...	...	0.61
Equal to Ammonia	...	...	...	0.74
Phosphoric acid	...	...	...	0.43
Equal to Tribasic phosphate of lime (or Tricalcic phosphate)	...	...	...	0.94
Potash	...	...	...	0.59

Leaves of deciduous trees are sometimes used for litter and generally the Autumn leaves shed by the trees. These are poor in fertilizers, much of the Nitrogen, Phosphate and Potash having gone back into the tissue of the trees before the leaves were shed.

TRANSPORT OF STABLE MANURE.

Dung can generally be got for the cost of removing in Cape Town, thus its transport represents its whole value.

The Agriculturist can generally cart his manure to the fields and spread it with a fork. The forest labourer may have to carry his up a mountain side. Hence the Forester has to use his stable manure or compost nearly dry. Farm-yard manure often contains as much as 80 per cent. water. In fact it contains nearly as much water as an equal bulk of milk.

A good supply of litter, peat or other absorbents enables the dung or compost to be gradually dried without material loss. When forming the "Peak" plantation on the barren stony slopes of Table Mountain, stable manure had to be removed from the stables in Cape Town, dried at the foot of the mountain, then carted up 1,500 ft. and then distributed by hand. This could not have been done economically if 60 or 70 per cent. of water had been left in the stable manure. In this case the stable manure was first dried and then transported up the mountain. Where the bulkiness of farm-yard manure is an superable obstacle to its use, as for instance on a steep mountain side where everything has to be carried by hand, the dung may be burnt and a small handful of ash and guano put in with each tree, the object of the guano being to supply the Nitrogen lost in the burning.

If one can afford to sacrifice half the Nitrogen, well-rotted manure may be used, since that weight for weight is stronger than fresh stable manure.

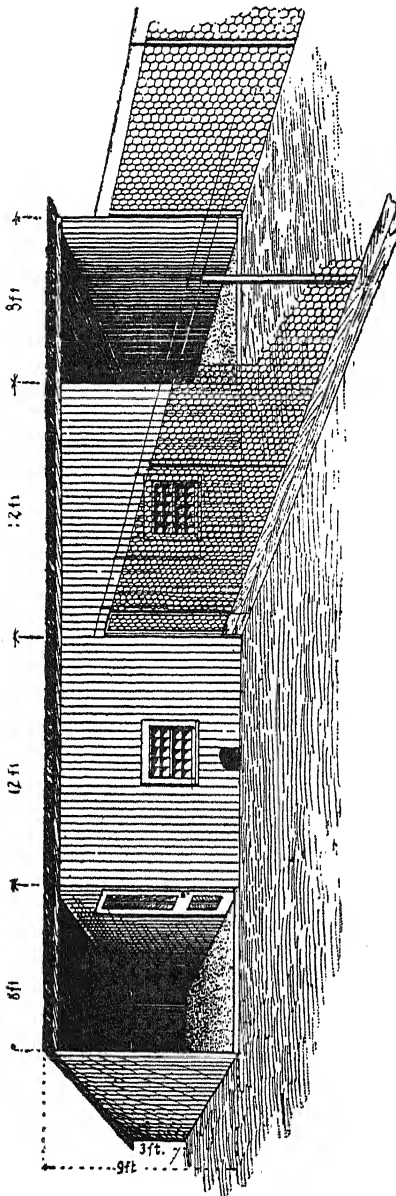
POULTRY FOR PROFIT.

CHAPTER V.

POULTRY HOUSES.

Many chapters could be written on this subject without embracing all the different modes of building houses and laying out the ground. Very much depends on the position and surroundings of the poultry house, in fact your success or failure depends on it to a great extent. The house which suits one locality might prove unsuitable in another. It should be so erected as to ensure a maximum of sun and a minimum of draughts to the birds. No matter in what district you may be situated the house must be "high and dry." A sandy floor is better than a clay floor because it more readily absorbs the drippings which of course must be removed at regular intervals. Elaborate poultry houses have no advantages over plain buildings except in appearance. There should be no nooks and crannies in your houses, as every one of them means a harbour for lice and parasites of every description you will need to decide for yourself what kind of house to erect. Whether a continuous house, separate house, or colony house. The continuous house system is a labour saving system and therefore is much in vogue in America. The continuous house has a great many advantages over any other style of house, and should be adopted by more poultry owners in this country. I have not the space at my disposal to illustrate or describe the different styles of house which have been used or are being used in this country. The one which is illustrated here is in my opinion specially adapted for use here and being easy to erect and not at all costly, should meet with the approval of some who intend building a poultry house and moreover this house can be altered in any way to suit your particular requirements. A thorough coating of Solignum is recommended on all wood work before it is fitted together. This preparation acts in a threefold manner viz, a stain, a wood preservative, and a lice killer. The following is a brief description of house as illustrated. The house is forty feet long twelve feet wide, three feet high in rear and nine feet high in front. The interior is divided by a board and wire partition into two pens 12ft. by 12ft. with a door in same next to front wall. The partitions are run 2ft. high from level of floor and from the top of this, wire netting to the roof. Netting is preferable to laths as it does not harbour lice. Each closed pen has an 8 by 12ft. scratching shed attached. If necessary a storm proof screen can be made to fit on the front of the scratching shed to close the open

portion in bad weather. In fact the whole front of the house may



be made on this principle in some localities, as I believe in plenty of fresh air for birds without draughts of course. If this oiled linen screen is used it should be hinged to the roof so that it may be locked up when not required. Canvas or heavy oiled linen are the two best materials for the purpose.

For frame work of house and rafters, 2 by 4 scantlings should be used and a good quality flooring or sheeting for covering in the house. The roof and walls should be all coated with Solignum applied hot, if possible, and roof then covered with good quality roofing material such as Flintkote. Flintkote is made in four thicknesses, is fire proof and when put on according to the direction sent out with each roll makes a permanent and good roof. The windows need not be large although plenty of light and air is absolutely necessary. The fences between the runs should be 6ft. high. It is a good idea to strain a length of wire about four inches above the top of the netting as this prevents birds from flying over. If you wish to make this house continuous it will be necessary to put a door in each end so that the attendant can go right through the houses without having to go down the runs. The block illustrating the house is the property of

Reliable Poultry Journal to whom I am indebted for the same through the courtesy of Messrs Geo. Findlay & Co. This is necessarily a brief description of how the house can be constructed. No doubt many people may be able (on these lines with modifications) to construct a house which may suit them better, but

remember the main points in a poultry house are these:—No draughts. Plenty of light and sun. No overcrowding. No nooks or crannies for lice. No wet floors or leaky roofs. A dropping board should be used under the roosts which can be unhooked in order to be washed and sunned. A house like above costs little to erect, can be put up by any handy man and it will accommodate a good sized flock.

“SHAMROCK.”

AGRICULTURAL SHOW DATES, 1907.

The complete list of Show fixtures to date is appended herewith. In the list published last month the date of the Caledon Show was given as March 14, instead of February 14. This is now corrected. Will those Societies which have not selected dates please do so as early as possible and communicate for publication without delay?

- Paarl, on Thursday, January 24.
- Stellenbosch on Thursday, January 31.
- Aliwal North, on Tuesday and Wednesday, February 12 and 13.
- Malmesbury, on Wednesday, February 13.
- Caledon, on Thursday, February 14.
- Bayville, on Friday, February 15.
- Western Province, at Rosebank on Tuesday, Wednesday, and Thursday, February 19, 20, and 21.
- King William's Town, on Thursday, February 28 and Friday, March 1.
- East London, on Thursday, Friday, and Saturday, March 7, 8, and 9.
- Barkly East, on Wednesday and Thursday, March 13 and 14.
- Molteno, on Tuesday, March 19.
- Bloemfontein, on Tuesday, Wednesday, and Thursday, March 19, 20 and 21.
- Oudtshoorn, on Wednesday, Thursday, and Friday, March 20, 21, and 22.
- Umtata, on Thursday and Friday, March 21 and 22.
- Midland Agricultural Society (Graaff-Reinet), on Tuesday and Wednesday, March 26 and 27.
- Bathurst, sometime in March, no date fixed yet.
- Cradock, on Tuesday and Wednesday, April 2 and 3.
- Albany Agricultural Society, at Grahamstown, on Thursday and Friday, April 4 and 5.
- Port Elizabeth, on Wednesday, Thursday, and Friday, April 10, 11, and 12.

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith. A *non de plume* may be attached for publication.

Sparrows, Finches, Rats and Moles.

Methods of Destruction.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Re sparrows and finches. In the *Journal* for August, "Farmer" wants to know how to kill the above birds. With a little trouble he can destroy them, viz., take two pieces of quartering, say 12 to 15 feet long. Put on two ends forming an oblong square and cover over with $\frac{1}{2}$ -inch wire or other netting. Stand it up edgeways propped with a stick three feet long, with a long line attached. *First feed the birds on a bare place with broken mealies*, then set the trap on that spot with plenty of food under it. Keep a youngster to pull the cord and let the net on to the birds. I have caught as many as 70 or 80 at a time. The birds caught can be eaten. Sparrow-pie is not bad. Cold and rainy weather is the best time to catch them.

Field Rats.—If beetroot is cut into fingers and strychnine well rubbed into them and put into the holes you will be astonished how little it takes to kill a lot of rats, mice or moles.—Yours truly,

W. E. MURRAY.

Rodebloem, Graaff Reinet,
August 24, 1906.

Swiss Milch Goats.

Goat Scab and Dipping.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—With regard to Swiss milch goats, I wish to thank Mr. Gardner and Mr. Rubidge for the information given through the *Journal*.

From letters received through other sources it would appear that the goats are likely to prove of the greatest value. That "unconsidered trifle," the milk bill, would materially be lessened even in townships where a few of these cheaply and easily kept animals may obtain a living. To the milk producer or dairyman in country townships, an animal of this class should prove a valuable assistant, for cows in the North-west are only fit for milking in good seasons, unless stall-fed, and are, generally speaking, poor milkers.

There is a tendency among farmers to keep down the number of their goats as far as possible. Goat scab, so difficult to cure, is the reason given. With a double milk supply from an improved stock of goats, the farmer who flinches at the prospect of scab may keep half the present number of Boer goats and still be well supplied.

With regard to goat scab (Boer goat), I have just had the opportunity to test the difficulty. I was freely told that dipping would *not* cure and the treatment was

watched with some interest by the sceptical. For the benefit of others I may state it here. Talking first six badly infected goats (their entire bodies were covered with scab), these were placed in a bath of Little's Dip, heated to 100° F., and for about two minutes the skin was well brushed while wet with an ordinary stable brush. The goats were then placed in a tank of the same dip for five minutes and again brushed on getting out. The dip in the tank was heated to 90° F., and in both dips the mixture was 1 in 40, which is stronger than the prescribed dip. Having tested the endurance of the goats so far, I allowed a week to elapse, and then dipped the whole flock in cold dip (1 in 50, Little's Dip) for four to five minutes, repeating in ten days. Finally the six scabby ones were rubbed down with lard oil to free the scales, and on inspection to-day I find them as soft and free from scab as babies.

If the treatment is considered too drastic, I would advise trying a few before risking the whole flock. None of the goats showed any signs of discomfort, except their natural disinclination to enter the dipping tank. In connection with this particular dipping I noted that whereas *sheep* lambs from one to three months old had been dying at the rate of four or five a week from what appeared to be inflammation of the lungs *before* the dipping, not a single lamb contracted the disease after the first dipping, and for a period of two months there has been no single case of sickness of any kind among all ages. I must add that the sheep were dipped twice in the ordinary way, and from information received from farmers it appears that the disease mentioned locally called "long ziekte" is very common among the autumn lambs and causes considerable loss. If sure that it is contagious and dipping a disinfectant, I shall dip on the first outbreak next season.

Perhaps you may be able to supply some information on this subject and scab, with its attendant Act, be after all a blessing in disguise, though we may not all regard it so.—Yours, &c.,

HERBERT ALSTON.

Van Wyk's Vlei, August, 1906.

Utility Poultry at Kimberley.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Since you are inviting correspondence on poultry concerns, perhaps you will not despise the experiences of a utility breeder. I commenced keeping fowls nine years ago, by buying two dozen white Leghorn stock birds. Finding that their plumage became tarnished and soiled by the sun and dust on their free run of about 10 acres, I gradually replaced them by Black Minorcas, and have kept to the latter ever since, except when I have to introduce fresh and more vigorous blood once every two years by purchasing white Leghorn Cockerels. The cross-bred hens obtained in this way are very healthy and lay a large number of beautiful white eggs.

I find that a stock of about fifty (more or less in different seasons) is all one person can manage satisfactorily. Three years ago I tried the experiment of running an incubator. The cheapest offered in the market was a 50 egg size "Bantam" sold by the Buckeye Incubator Company in America for 5 dollars (about £1 sterling.) This same useful little machine has been constantly at work ever since, winter and summer and produces an average of 50 per cent. of healthy chickens during the year, taking good and bad hatches together. The company provide both the hot-water and hot air systems, and they are equally successful. I am now running three hot-water machines and one hot air machine. It is a misnomer to call an incubator heated by hot-water a "moisture" incubator. They are just as dry inside the chamber as the hot air variety and if moisture is wanted (as it most certainly is in Kimberley) it must be supplied specially. The best and easiest plan is to have a shallow pan (the "Bantam" has a zinc tray for the purpose) fold a piece of loosely woven canvas, coffee-bag does very well, into this and wet it with tepid water at about 85°. This pan is placed inside the egg chamber underneath the egg tray and cleaned and the cloth changed twice a week.

Having an opportunity lately to purchase a 50 egg "Hearson" at half price, I went in for that method. It is very scientific, and ornamental and costly and gives good results; still I do not see how it can surpass my cheaper and plainer but equally efficient little incubators. The ease with which you can turn and watch your eggs, without exposing them to draughts and chills, speaks for the "Bantam," whereas you never know what is going on inside the Hearson, unless you pull out the drawer, at the risk of killing or maiming chickens in the act of hatching out.

The "nursery" attached to the Hearson is a boon, and I use it now for all my

incubators. The Buckeye Incubator Company also supply more expensive machines, in which after the manner of the "Cyphers," the chickens come forward and drop into a "nursery" underneath the eggs where they have top heat and comfort, while waiting for their slower fellows. The most important things in incubating—to my mind—are to beware of over-heating, and never to open the incubator after the 19th day, until the hatch is completed. I have now and then helped tardy chickens out. They have never been strong and seldom survived a fortnight.—Yours &c.

A. BUCHER.

Late Army Nursing Sister.

Sept. 10, 1906.

Water Finding by the Divining Rod.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Having noticed in the April *Journal* a letter signed by R. H. Pringle re the above subject, I may state I have been working on various works with the object of obtaining water for over thirty-five years, and have the instinctive knowledge of being able to trace water veins.

As a farmer in the Karoo, I have sunk several wells on veins with great success. These veins are invariably from three to five feet wide, according to the formation of the rock. Previous to the war I obtained the use of a drill from the Government, which I used most successfully on farms in the Piquetberg district, and whilst engaged in this capacity, I became acquainted with a man who professed to be able to find water with the divining rod, but need hardly say was at first most sceptical on the matter; but, however, on trying the diving rod on myself and six sons, I found that the rod worked with absolute accuracy on one son, and since then I have used him to point out water on various occasions. There are men, no doubt, who state they are able to find water by means of the rod, but I must say a good many of them are dishonest rogues, much to the detriment of the farmers who employ them. In my experience the depth or quantity of water cannot be gauged by the rod, nor can minerals be divined by it.

A further peculiarity of the rod is that it is only effected by water veins, and not rivers or pipes. The mystery of the divining rod can be explained away, I think, by the presence of gas, or, perhaps, electricity in these veins which acts in a most miraculous manner on the nerves of a would-be water finder. There are many who are able to divine the presence of water by the rod, but for want of experience in following up the vein, are unable to accomplish the desired object. If I had means of purchasing a boring machine, I would guarantee to obtain water anywhere I bored at a depth of less than 100 feet. The Cape Town Council are annually spending large amounts on unremunerative new water schemes, whereas there is a strong water vein above the city of Cape Town, which yields many thousands of gallons of water daily. This vein I should be pleased to point out to any Councillor in the event of my expenses being defrayed.—Yours, &c.,

G. J. P. SINCLAIR.

P.O. Grabouw, Sept. 6.

"Cancer Bush."

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I feel sure that many farmers in this and other parts of the Colony will have read Mr. Gid. F. Joubert's letter in the last number of the *Agricultural Journal* with much interest.

From the description he gives of the shrub or plant and its habits, it seems to me just the thing we require here badly.

During the winter months we have an abundance of dry grass, and something which can stand frost and thrive without irrigation is what is badly required. June, July, and August are our pinching months.

I beg to thank Mr. Joubert for bringing the matter to notice in the *Agricultural Journal*.

If other farmers know of any other plant or shrub (natural to South Africa) which will grow and give succulent feed during the winter months, without irrigation, I will be glad to hear from him, direct or through the *Agricultural Journal*.

J. FRED. PENTZ.

Progress Farm, P.O., Vryburg.

Refractory Cows.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Re "A. E.'s" query about his refractory cow, I strongly suspect it is an acquired habit with her, and the former owner may have sold her for that reason, or the change from having one milker to the other may be the cause. Should the calf be young, say from two to three months old, I should advise "A. E." to try gentle handling, which will, in all likelihood, break her of the habit. Tie the cow up quietly and gently if she is not accustomed to be milked loose, let the calf suck her well; don't feel the teats. You must exercise a little judgment, and by the look satisfy yourself she is ready for milking, then tie the calf up at her head and start. If she refuses to give her milk, loosen the calf and leave them quietly alone. On no account attempt a second milking; it will only encourage her in her pernicious habit. Continue that for a week or ten days, and if she does not yield, she is, in all probability, incurable.

Cows very often refuse to give their milk when nearing weaning time, and in that case they should not be bothered, but allowed to have their way. Sometimes they are fast breeders, taking the bull regularly within two or three months after calving; in which case left in their natural state are of very little value as milk producers, and for a very sound reason too.—Yours, &c.,

C. F. ZIETSMAN.

P.O., Klein Platts, dist. Humansdorp.

Mealies as Poultry Food.

To the Editor, AGRICULTURAL JOURNAL.

SIR, In your September issue "Shamrock," in his reply to "Chick" re unfertile eggs, remarks that "mealies are the worst food you can give your birds." I hardly agree with him therein, unless fowls are overfed with it.

About fifteen grains per bird a day with a warm soft meal in the morning will increase the laying, and if a sufficient percentage of pure-bred male birds are kept, there will be very few complaints about unfertile eggs. At least such is my experience.

My birds have the free run of the farm, and are fed as above mentioned, and an unfertile egg is rarely found. Poultry keepers, especially the farmers hereabout, will do well to have a separate enclosure for some of their best laying hens with pure-bred male birds, the eggs of which to be used for setting. The rest of the flock will need no male birds, as they lay just as well without.

A good laying strain of birds can thus be established, and a lot of money saved. The outlay for extra food required when male birds for the whole flock are kept will in a very short time cover the cost of a decent enclosure.—Yours, &c.,

"MEALIE."

Klein De Hoop, P.O., Philadelphia.

Valuable Feathers at Willowmore.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—On Tuesday last, Messrs. Arthur & Co. (Export) Ltd., sold for our account on the Port Elizabeth Feather Market the tail feathers of three cock ostriches, which realised £9, £8 17s. 6d., and £8 12s. 6d. respectively. These birds were bred in our district by Messrs. E. H. Colborne and F. W. Baker. We believe this is the record price paid for White Tails for the last twenty years.—Yours, &c.,

WATTS, HERBST & Co.

Willowmore, August 30.

Artificial and Natural Incubation.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I should be much obliged if you can give me any reason for so many germs dying in shell about the eighth day. I use a Cypher's Sixty-six Egg Machine, 1906 pattern, and in every hatch I find about 10 dead germs on the tenth day. I have tried running machine low, 102° to $102\frac{1}{2}^{\circ}$ for the first week; also at 103° throughout, but results the same. Have turned the eggs regularly, and tried both with cooling and without, with vents open and shut, but results no better. Thermometer is correct and in correct position.

The Cyphers expert says the germs are weak, but from same eggs have twice sat 26 eggs under hens and hatched 100 per cent. With the Incubator 20 per cent. die by the tenth day and 20 per cent. by the eighteenth day; have tried with and without moisture, results the same.

If you can give me any information as to causes of above, it will be of great help. Machine maintains a very even temperature, not varying a degree for days. Can you tell me what machine is the best for these parts.

A friend has 2 Buff Orpington hens and cockerel, 10 months old. In setting eggs under hens, the chicks develop fully, but cannot break the shell, as the foot and toes are closed over the beak. Twenty-four eggs were all similar. When helped out they did well. Can you kindly give me a reason for this.—Yours, &c.,

R. H. BUTCHER.

Platberg, Middelburg, C C.

The problem of dead in shell has not yet been solved, so it would yet be presumption on my part to try to do so. The only way I can help you is by making a few suggestions.

Be sure that your incubator is on a level cement or clay floor and in a room in which the temperature is fairly even. If the temperature of the room in which the machine is working is 60° or under, work with ventilators closed during the whole hatch and run machine at $102\frac{1}{2}^{\circ}$. Moisture unless properly applied is worse than useless. Do not dip or spray the eggs. Sprinkle the floor on which the Machine is standing with water daily, after the 10th day. If your hands are very cold do not turn the eggs with the bare hand, as the chill of your hand, may affect the germ. It stands to reason, that if the machine hatches 10 out of 60 eggs, it ought to hatch the remainder, granted that the eggs are the same, unless these individual eggs have had some slightly different treatment to the remainder. If eggs *sweat* during the first couple of days it shows they are drying off too quickly; they will then need moisture applied as stated above.

Your query concerning chicks misplaced in shell I cannot answer. I have never heard a case of the sort before and can only put it down to a freak, or nest being disturbed. A thunderstorm might affect the eggs in this manner. I have found Cypher's *Standard* a good machine in every respect.—SHAMROCK.

RURAL REPORTS.

For the month ending 15th September, 1906.

Aberdeen.—Weather continues dry and rain is wanted. Beyond a little oats and barley very little has been sown. Severe frosts have been experienced but, so far no damage has been done. Stock remains in fairly good condition.

Aliwal North.—Lately the weather has been warm and windy with very light rainfall and the veld is in bad condition. Cereals doing poorly. Stock also poor.

Barkly West.—Very light rainfall and veld very dry. Mealies and Kafir Corn in good condition considering the season. Stock doing fairly well. Rain is very badly needed.

Bathurst.—Dry and windy weather with light rainfall. Fair crop of Citrus fruits. Good crop of cereals expected, but rain needed. Stock in fair condition.

Beaufort West.—Owing to regular rains since September last the condition of the veld is excellent and water abundant. All kinds of stock are in good condition and the lambing season is most successful. The rams sold at the recent annual Ram Sale were in splendid condition, and fetched very good prices. No special diseases in animals have lately been reported. As rains have fallen during the present month the prospects of a good crop are very bright. Peach yellow and the Codling Moth did considerable damage to the fruit crop last season.

Bedford.—Weather very windy and rainfall below the average. Veld very dry and getting worse owing to the high winds. Lucerne badly requiring rain. Stock doing fairly well.

Bredasdorp.—Weather cold with light rains and veld in fairly good condition. Grain and Lucerne doing badly. Stock generally in good condition.

Burghersdorp.—Weather unsettled and changeable and veld in bad condition. Stock doing poorly on account of protracted drought.

Calvinia.—Weather cold with light rainfall. Veld in good condition. Grain and lucerne also in good condition. Stock generally doing well.

Cape.—Mild weather with light rainfall. Veld in good condition. Cereals doing well. Stock in good condition.

Carnarvon.—Winter breaking up with occasional high winds. Very light rainfall. Wheat coming on well. Stock in good condition.

Cathcart.—Weather cold and windy with no rain and veld very dry and parched. Fruit trees in bloom. Cereals very backward and parched. Stock doing badly except horses which are in fair condition.

Ceres.—Very cold weather with severe frosts and light rainfall and veld in very bad condition owing to frosts. Fruit trees not blossoming yet on account of the cold. Wheat and oats very promising, mealies not sown yet. Cattle and horses in poor condition. Sheep and goats doing fairly well for the time of year.

Craddock.—Weather cold and windy with very light rainfall. Fruit season promising. Crops fairly promising. Stock doing well.

East London.—Weather cold and windy with practically no rain. Crops suffering considerably from drought and winds. Stock in fair condition.

Fort Beaufort.—Weather dry and windy with hardly any rainfall. Very little grain grown in this district and report from Adelaide states that unless rain falls soon, the crop of wheat will be an absolute failure. Stock in fairly good condition but seems to be falling off considerably.

George.—Bright warm days and cold nights. Rainfall very light and veld dried up. Fruit trees just budding. Cereals looking healthy but suffering from drought. Considering the bad state of the veld stock is in fairly good condition.

Hay.—The weather has been windy with light rainfall. There is a great scarcity of grass. The few vines there are are doing very well. Very good varieties of fruit but only small quantities. Very little grain and lucerne is sown on account of the lack of irrigation. Stock generally doing very well.

Herbert.—Weather cold with no rainfall. Cereals only lately sown. Stock generally doing well.

Herschel.—Fine weather during August but no rains and veld in poor condition. Very little fruit grown. Very small crop of cereals sown so far and what there is, is suffering from want of rain. Stock generally doing well.

Jensenville.—Very windy weather with no rains and veld accordingly very dry. Vines which are mostly on Cape stocks are looking healthy. Cereals badly in want of rain. Stock doing well.

Kenhardt.—Cold and windy weather with no rains and veld in very bad condition. Stock generally not doing well.

King William's Town.—Weather very windy and hot for this time of the year. Practically no rains have fallen. The crops are all being burnt up owing to lack of rains. Stock in fair condition.

Komgha.—Cold and windy weather with light rainfall and veld accordingly very dry. In some parts fruit trees are beginning to bud. Crops suffering somewhat from want of rain. Stock in pretty good condition.

Ladismith.—Weather very windy with no rain and veld very dry. Oranges and Naartjes are the only fruit and they are suffering somewhat from Red scale and rotten roots. Cereals suffering very much from drought. Lucerne in fairly good condition. Stock generally poor.

Malmesbury.—The weather has been cold with fair rains. Condition of veld improving. Cereals doing well. Stock generally in fairly good condition.

Middelburg.—Windy weather with practically no rain. Veld very dry. Cereals inclined to be backward. A few farmers are just starting to cultivate lucerne. Stock in fair condition.

Molteno.—There have been no rains and the veld is in poor condition. No cereals. Cattle not doing very well but other stock in good condition.

Mossel Bay.—Cold weather with very little rain and veld consequently very dry. Cereals and lucerne look promising. Cattle in fair condition, other stock doing well.

Murraysburg.—Weather a little warmer than last month. No rains have fallen and the veld is consequently getting dried up. Crops fairly promising notwithstanding the want of rain. Lucerne started well but will be a failure unless rain falls soon. Stock doing well.

Oudtshoorn.—Weather uncertain and veld in fair condition. Rainfall very light. Cereals and lucerne promising. Stock generally doing fairly well.

Peddie.—Very dry weather with heavy winds. Rainfall very light. Very little fruit grown. Very few crops and they are badly in need of rain. Stock generally in fair condition except lambs which are not doing well.

Piquetberg.—Weather windy. In some parts the veld is in fairly good condition in others bad. In Ward 4 the rainfall has been heavy and the veld is looking well. In Ward 5 the rainfall was light and the condition of the veld bad. Grain and oats doing well. Stock generally in good condition.

Port Elizabeth.—Very windy weather with very light rainfall. Veld rather dry and would benefit by a little rain. Crops doing well and stock generally is in good condition.

Queenstown.—The weather has been bad with very severe frosts and high hot winds. Condition of veld varies considerably. Very light rainfall, far below the average. Fruit just beginning to bloom. Not much wheat or oats were sown and what there is is not doing well on account of the high winds and dust. Lucerne is beginning to come on well. Stock with a few exceptions in very good condition.

Riversdale.—Cold and windy weather with light rainfall and veld in bad condition. Vines doing well. Crop of cereals not very good. Plenty of lucerne but rain needed. Stock in fairly good condition.

Robertson.—The weather has been cold and the veld is in fair condition. A good number of vines have been grafted this winter and great hopes are entertained. Wheat doing fairly well and oats very well. Stock not doing very well owing to want of rain and the severe cold.

Somerset East.—High winds have been experienced followed by sunny days and exceptional frosts. Rainfall light. Cereals yet young. Stock doing well.

Springfontein.—Weather variable and cold with light rainfall. Veld in poor condition. Stock in poor condition.

Steynsburg.—Windy weather with practically no rain and veld in fair condition. Cereals in need of rain. Stock in good condition.

Stutterheim.—Rainfall less than previous season with windy weather and veld in very dry condition. A little quantity of wheat and barley sown but a good crop of oats is expected. Stock generally in fairly good condition.

Tarkastad.—Cold weather and practically no rain. Veld very dry. Crop of cereals poor. Stock generally in fair condition.

Uitenhage.—Weather windy and cold with very light rainfall. Veld in fair condition. Fairly promising crop of cereals. Stock generally doing well.

Upington.—Dry and stormy winds from the North and veld in bad condition. Grain and Lucerne promising. Stock generally doing fairly well.

Van Ryn's Dorp.—Cold weather with average rainfall and veld in fair condition. Wheat, barley and oats, though yet very young, doing well. Stock poor.

Victoria West.—Windy weather with practically no rain. Cereals and Lucerne doing well. Stock also doing well.

Willowmore.—Very windy weather with warm days and veld very dry. Fortunately good rains have fallen. Oats and Lucerne promising well. Stock generally doing well.

Worcester.—Cold weather with light rainfall. Veld in fair condition. Cereals doing fairly well. Stock generally in fairly good condition except in Ward 5 where cattle and horses are doing rather poorly.

THE TRANSKEI.

For the month ending 31st August, 1906.

Flagstaff.—There is nothing of interest to add to my report for last month. The rainfall was practically nil. The pasturage is in very poor condition. Stock is in fair condition and free from disease.

Kentani.—There is nothing to report. The country is very dry and rain is much needed. Stock has fallen off considerably in condition owing to the drought.

Lusikisiki.—Nothing to add to last month.

Matatiele.—High winds have prevailed during the month and in consequence the pasturage has been dried up. No rain has fallen, and in parts of the district the veld is so covered with dust that the stock won't eat it. Stock, both large and small, is in very poor condition and, if the drought continues, the consequences to the farmers will be most disastrous. Already the price of grain has risen considerably. With the exception of an outbreak of glanders, for the suppression of which the usual prompt measures were taken and the disease stamped out, no animal diseases have been reported and the health of stock is good.

Mount Frere.—There has been no improvement in the weather during the month, which has been very windy, dusty and dry. There has been no rain and the veld is very dry—parts which usually begin to spring at this time of the year are very backward. Consequently stock and especially sheep and goats are getting in poor condition. The lambing season has been bad and most of the lambs have died. The natives mostly lamb their sheep in the winter. There will be fewer sheep and goats in the district than before and unless it rains shortly there will be heavy loss. A cold rain now would spell ruin to many. Slaughter stock is unobtainable and scab has again appeared in horses. There has been a fresh outbreak of lung sickness. The herd has been quarantined as usual.

Nqamakwe.—The past month was very dry with alternate hot and cold winds, and the veld is parched throughout the whole district. The condition of the stock is normal. No locusts made their appearance.

Willowvale.—No rains have fallen during the past month, and the country is very dry. Owing to the drought no agricultural pursuits are in progress. Stock is in fair condition, and no outbreaks of Lung sickness or Redwater have been reported.

NOTES ON THE WEATHER OF AUGUST, 1906.

By CHARLES M. STEWART, B.Sc., Secretary to the Meteorological Commission.

A mean pressure practically the same as the average, exceptionally cold days and nights, with severe daily frosts, skies cloudier in the South-West but clearer than usual elsewhere, several falls of snow and sleet, most widespread on the 8th, a continued deficiency of rainfall, a comparative absence of fogs, mostly local, a few cases of thunderstorms and several gales were the most noteworthy features of the weather of August.

Precipitation.—The rainfall during this month amounted on the mean of 312 stations to only 1·06 in. falling on four days, being 0·50 in., or 16 per cent. less than the average. Although this amount is 0·45 in. more than the mean for July, a com-

Division.	Mean Rainfall (1906). Inches.	Mean No. of Days.	Average Rainfall (1891-1900). Inches.	Average No. of Days.	Actual Differences from Aver- ages.	Percentage Differences from Aver- ages.
Cape Peninsula ..	5·03	13	5·94	12	— 0·86	— 14
South-West ..	4·15	10	3·24	8	+ 0·91	+ 28
West Coast ..	1·70	10	1·44	5	+ 0·26	+ 18
South Coast ..	0·73	6	2·16	6	— 1·40	— 65
Southern Karoo ..	0·28	3	0·85	3	— 0·57	— 67
West Central Karoo ..	0·37	2	0·48	2	— 0·11	— 23
East Central Karoo ..	0·13	1	0·71	2	— 0·58	— 82
Northern Karoo ..	0·07	1	0·52	2	— 0·45	— 87
Northern Border ..	0·00	0	0·25	1	— 0·25	— 100
South-East ..	0·17	2	1·39	4	— 1·22	— 88
North-East ..	0·03	1	1·17	3	— 1·14	— 97
Kaffraria ..	0·08	1	1·22	4	— 1·14	— 93
Basutoland ..	0·00	0	1·15	3	— 1·15	— 100
Orange River Colony ..	0·00	0	0·69	2	— 0·69	— 100
Durban (Natal) ..	0·27	3	1·93	..	— 1·66	— 86
Bechuanaland ..	0·00	0	0·36	2	— 0·36	— 100
Rhodesia ..	0·00	0	0·11	1	— 0·11	— 100

parison of the above table with that for the previous month shows that only over the West Coast and the South-West Divisions has the deficiency been converted into an excess, whereas the small surplus of 13 per cent. over the South Coast in July has this month been turned into a minus quantity amounting to 65 per cent. less than the normal. The absolute drought of the previous month that prevailed over the Northern Border, Basutoland, the Orange River Colony, Bechuanaland, and Rhodesia continued with unabated severity throughout the month of August, and the unusually small precipitation over the South-East Division during July has still further decreased this month. The slight increases over the remaining Divisions during August are mostly too small to be worthy of consideration,—except over the Cape Peninsula, the South-West, and the West Coast, where the August rainfall was about two, three, and four times the corresponding quantity recorded during July. Taking the four winter months (May—August) as a whole, it is seen that the mean rainfall over the Colony for this period (5·32 ins.) is 0·85 in., or 4 per cent. less than usual. This deficit has been most marked over the Cape Peninsula, where the mean total for these four months

was only 16·34 ins., as against an average of 22·97 ins.—a deficit of 6·63 ins., or 29 per cent. Or considering the period January—August inclusive, there has been a continuous deficiency since February, the mean for the eight months being only 21·84 ins., as compared with an average of 29·10 ins., that is an actual rainfall of only three-fourths the usual quantity. Summarising the totals for the month, it is found that, of the 312 stations, 106 suffered from absolute drought throughout the month, while 132 had records of 0·01 to 1 in., leaving only 74 or 24 per cent. with more than an inch. Of these, 16 had 1·01 to 2 ins., 18 had 2·01 to 3 ins., 14 had 3·01 to 4 ins.; the remaining 26 having more than 4 ins. were entirely confined to the Cape Peninsula and the South-West Divisions, and of these 8 had 4·01 to 5 ins., 4 had 5·01 to 6 ins., 5 had 6·01 to 8 ins., and an equal number had 8·01 to 10 ins., the remaining 4 with more than 10 inches were Newlands (Montebello), 10·09 ins.; Wynberg (St. Mary's), 10·14 ins.; Bishops-court, 11·51 ins.; whilst the maximum for the month was 12·22 ins. at Ceres. A similar absence of very large amounts in any 24-hour period is brought out by an analysis of the records of the 308 stations supplying the necessary information, the heaviest fall in any one day being 3·45 ins. on the 7th at Ceres. Omitting the 106 with "Nil," 182 stations had 0·01 to 1 in. as the maxima for the month, 14 had 1·01 to 2 ins. The remaining five with more than 2 inches were: Newlands, 2·27 ins.; Bishops-court, 2·29 ins.; Kenilworth, with 2·36 ins.—all on the 28th; whereas Wynberg, also in the Cape Peninsula, had 2·40 ins. on the 10th, and Vijgeboom's River had 2·90 ins. on the 8th. One somewhat unusual and striking fact in connection with the rainfall distribution over the Cape Peninsula during August was that much more rain fell at the lower stations situated on the eastern slopes of Table Mountain than was recorded by the gauges on the mountain itself. *Thunderstorms* were reported from six stations on three days, principally the 14th. *Hail* fell at 14 stations on four days, chiefly the 7th and 8th. *Sleet* was reported as occurring at 33 stations on 12 days, chiefly 7th to 9th and 14th to 15th; while *Snow* occurred at 58 places on eight days, most widely on the 8th. This last form of precipitation occurred most widely from 7th to 9th, and fell over an extensive tract of country. The area affected may be said to be roughly that portion of the Cape Colony lying south of a line drawn from Table Mountain, in the Cape Peninsula to Sutherland, thence through Nel's Poort, De Kruis (Div. Murraysburg), along the Sneeuwberg Range to Thomas River in the neighbourhood of the Kogolga Range. This storm was one of the most severe that has been experienced over the South-Western Districts in recent years. The other storm, on the 14th and 15th, extended over a much more limited area between the Stormberg and Quathlamba Ranges on the south and the Orange River on the north, and extending from Steynsburg to Barkly East, although some snow fell also at Sutherland and at Hogsback during the same period.

Temperature, Cloud and Wind.—Although the mean pressure was practically the same as the average, the weather of the month was characterised by unusually low mean temperature, a continuation of what prevailed during July. The mean of all the stations was 52°·3, or only one degree (1° F.) warmer than during July, and 34°·9 colder than the average. The higher temperature of the month was almost entirely due to insolation, the mean maximum being 65°·3, and the mean minimum only 39°·4, as against 63°·7 and 39°·0 for the previous month. The deficiency in the monthly temperature was practically equally divided between the days and nights, and, consequently, the mean daily range was only 0·1° more than usual. The departures from the averages were mostly about 4° in the South-West and the interior, about 2–3 degrees over the West Coast, the South Coast, the South-East and Basutoland, and about 2° over Kaffraria. Hope Fountain in Rhodesia had a mean temperature about the average. The day temperatures were generally below the average (except over portions of the South-East, Kaffraria, and apparently Rhodesia, where there was an excess of between 0·3° and 1·5°) by amounts varying from 6·3° at Hopetown to 0·2° at Molulie's; whilst the amount of nocturnal radiation was everywhere in excess of the normal by amounts ranging from 6·2° at Hanover to 0·3° at Slutterheim.

The mean warmest was Hope Fountain, with 60°·0°, and the mean coldest Hanover, with 44°·0°, a difference of 16°. The highest mean maximum was 74·8° at Hope Fountain and the lowest mean minimum 24·4° at Hanover. The warmest days of the month were most commonly the 3rd, 19th, 20th, and 24th to 26th, although a few maxima were also registered on other dates. The coldest nights were those of the 1st to 4th and 8th to 10th, although nocturnal radiation was also intense on a few days in the third and fourth weeks. The mean of the absolute maxima was 82°·2° or 7·1° above the corresponding value for July, whilst the mean of the lowest temperatures was 28°·9°, or 1·7° less than the previous month. The mean monthly range was, therefore, 53·3°, shewing much greater variation in temperature than during July, when the corresponding value was 8·8° less. The highest reading recorded during August was 98° on the 26th at East London, whilst the extreme minimum

of 14° was noted on the 1st at Hanover, and on the 8th at Leribe,—an extreme monthly range of 84° minimum. Temperatures lower than 32°F. were the rule throughout the month, as is further shown by no fewer than 250 instances of *Frost* being reported during the month. This phenomenon was of daily occurrence, more particularly from 1st to 4th, 9th to 12th, 16th to 18th, and 30th to 31st. In consequence of this unusually low temperature of the month, fruit trees are stated to be about three weeks later in blossoming than last year—a state of affairs which may prove more beneficial than otherwise, as they will be less liable to be affected by the occasionally severe frosts in September.

The mean percentage of sky obscured by *Cloud* was 33 or 4 per cent. more than the average, and one per cent. more than during July. *Cloud* was most prevalent over the South-West, where it was mostly between 55 and 65 per cent.; the proportion decreased eastward along the coast to 35 per cent. at East London, whilst inland it was mostly slightly under 20 per cent. The cloudiest station was Table Mountain with 74 per cent. whilst only six per cent. of the sky was obscured on the mean of the month at Hope Fountain, in Rhodesia. There was a further decrease in the number of *Pogs* or *Mists* reported, only 50 cases being noted on 24 days, most widely on the 24th. No instances of this meteor were noted from 2nd to 4th, 13th, 16th, 17th and 26th.

The mean wind-force seems to have been about the average, the value on the Beaufort Scale being 2.13 corresponding to a velocity of 13.65 miles per hour. The prevalent direction at 8.30 a.m. was Easterly to North Easterly in Namaqualand and at Kimberley, Northerly to North Westerly in the West and South-West (but much more Northerly than usual over the Cape Peninsula), Westerly along the South and South-east Coasts and mostly North Westerly in the interior, although it was reported as being South-Easterly at one or two stations in the High Veld and at Hope Fountain. Strong winds were somewhat more frequent than during July, these being reported as attaining the force of a gale at 29 stations on 15 days, most widely on the 7th and 25th. *Hot Winds* occurred at 9 places on 8 days, while *Duststorms* were noted at an equal number of stations on the same number of days.

OBSERVERS' NOTES, AUGUST 1906.

GROOT DRAGENSTEIN.—Both maximum and minimum temperatures below the average.

Mean of month 3.0° below the average (7 years). Rainfall 0.10 ins. above average (13 years). The minimum on the 9th, $-32^{\circ}.1$ —the lowest ever recorded here and many Sub-tropical plants and fruits were injured.

KORSTAD (The Willows).—Some severe frosts. No rain. Veld parched. Outlook serious unless some rain falls soon. The last rain and that but 0.02 fell on July 1st. Fruit trees are later in blooming than last year by some three weeks.

VRUCHTHAAR.—An exceptionally cold August. Frost several mornings which is unusual here. Fruit trees and Vines at least three weeks later than last season. All indications are for good crops.

KERSEFONTEIN (Namaqualand).—On the 9th had one of the heaviest frosts experienced here.

TORCHDACHT.—North East winds nearly every day.

DROOGFONTEIN.—No rain, country hereabout in terrible state. Winds of daily occurrence with plenty of dust.

THEERFONTEIN.—Almost continuous frosts; very severe during first week. Prevailing winds, N.W. Rain badly needed.

THE MEADOWS (Schoombie).—This month is quite the driest we have had; nothing but wind and dust. No sign of rain.

WAVERLEY.—Very windy all the month. Cold weather and very severe frosts.

SUNNYSIDE (Albany).—Alternate warm winds from North West and cold winds from South West. Crops in good condition considering the drought, would do very well if we got rain now. Trees are blossoming very irregularly, through want of warmth. Driest August for 5 years.

CARNAARON FARM.—Twenty-two windy days, frost on 27 days, cloudless days 11. Stock poor, but little, or no deaths so far. Crops bad.

DORDRECHT.—Drought still continues.

THIBET PARK.—Very bad month. Most severe frosts, hot winds, dusty and dry.

VENTERSTAD.—Hard frosts during the month. Country dry and parched.

KORSTAD.—Country dry and parched. Farmers are obliged to feed stock with mealies, etc. Stock in very low condition. On several farms, lambs are dying from want of nourishment.

MOVENI.—Generally dry crisp days. Many very windy days towards the end of month.

TEMPERATURE, AUGUST, 1906.

Stations.	Mean Max.	Mean Min.	Monthly Mean.	Abs. Max.	Date.	Abs. Min.	Date.
Royal Observatory ..	59·8	44·4	52·1	76·0	3	33·1	9
Simon's Town ..	62·1	48·3	55·2	81·0	3	40·8	8
Cape Town (S. A. College) ..	61·3	45·5	53·4	79·0	3	36·5	9
Wynberg ..	61·1	43·4	52·3	79·5	3	34·0	9
Sea Point ..	60·0	47·1	53·5	78·3	4	39·8	22
Blauwberg ..	58·8	45·4	52·1	80·5	3	37·0	9
Table Mountain (Disa Head)	53·3	38·8	46·0	70·0	19	31·8	8
Groot Drakenstein ..	61·4	41·2	51·3	79·0	3	32·1	9
Wellington ..	61·2	42·6	51·9	71·2	3	34·9	10
Eisenburg Ag. College ..	59·9	40·5	50·2	76·2	4	31·5	9
Ceres ..	59·6	38·3	49·0	66·0	20	22·0	9
Port Nolloth ..	65·1	43·7	54·4	92·0	3	36·0	1
O'okiep ..	62·5	40·1	51·3	81·0	24	32·0	30
Cape St. Francis ..	64·0	47·1	55·5	87·0	20	36·0	30
George Plantation ..	64·6	42·5	53·5	80·5	19	34·0	9
Heidelberg ..	70·7	37·1	53·9	86·0	19	29·0	9
Cape L'Agulhas ..	59·6	47·3	53·5	77·0	3	39·0	8
Van Staaden's ..	67·3	45·3	56·3	81·0	21 & 26	37·0	10, 13 22 & 27
Port Elizabeth ..	66·6	48·3	57·4	88·0	20	41·0	9
Storm's River ..	65·2	42·6	53·9	83·0	20	37·5	16
Amalienstein ..	68·3	36·3	52·3	83·0	24	24·0	9
Hanover ..	63·5	24·4	44·0	78·0	24	14·0	1
Murraysburg ..	63·1	34·1	48·6	81·0	24	19·0	1 & 8
Kimberley ..	70·4	34·5	52·4	87·2	24	26·5	1
Hope Town ..	67·0	31·0	49·0	85·0	24	22·0	1
Stutterheim ..	68·7	43·5	56·1	88·0	24	34·0	2
Queenstown ..	68·0	36·7	52·4	84·0	24	24·0	16 & 27
Oathcart ..	64·0	38·2	51·1	81·1	25	28·1	13
Sydney's Hope ..	66·9	43·4	55·2	89·2	25	28·0	1 & 18
East London ..	69·8	47·3	58·6	98·0	26	41·0	3
Aliwal North ..	66·3	30·0	48·1	82·5	24	19·0	3
Bensonvale Institute ..	62·2	28·0	45·1	78·0	24	15·0	1
Rietfontein (Aliwal North)	61·6	27·6	45·6	77·5	24	18·5	16
Main ..	69·8	39·9	54·8	91·0	25	23·0	8
Umtata ..	73·6	36·6	55·1	94·0	25	25·0	4
Kokstad (The Willows) ..	69·1	34·0	51·5	86·0	25	19·8	3
Port St. John's ..	70·7	48·5	59·6	90·0	26	42·0	14
Tabankulu ..	70·9	41·0	56·0	93·0	28	31·0	2
Moyeni, Quthing ..	64·1	34·0	49·0	79·0	24	22·0	1 & 2
Mohale's Hoek ..	68·1	34·1	50·1	78·0	24	14·0	8
Teyateyaneng ..	66·0	31·3	48·6	80·0	25	18·0	2
Leribe ..	66·7	28·7	47·7	80·0	24	14·3	1
Kuruman ..	69·6	29·0	49·3	82·6	25	20·0	4
Hope Fountain ..	74·8	45·2	60·0	81·7	29	32·0	4
Rhodes' Matopo Park ..	72·2	43·2	57·7	80·0	30	31·0	3
Means ..	65·3	39·4	52·3	82·2	..	28·9	..
Extremes ..	..	..	..	83·0	26	14·0	1 & 8

RAINFALL, AUGUST, 1906.

I. CAPE PENINSULA :		INCHES.	III. WEST COAST:— <i>continued</i>		INCHES
Royal Observatory (a) 12 inch gauge ..	..	2·87	Springbokfontein ..	..	1·49
Cape Town, Fire Station ..	..	2·54	Concordia (Krophol) ..	..	0·64
Do South African College ..	..	3·52	Garies ..	..	0·24
Do Molteno Reservoir ..	..	3·61	Clanwilliam (Gaol) ..	..	1·16
Do Platteklip ..	..	4·71	Dasson Island ..	..	2·21
Do Signal Hill ..	..	1·92	Kersefontein ..	..	2·07
Do Sea Point (Hall) ..	..	2·42	The Towers ..	..	2·96
Do do. (Attridge) ..	..	2·47	Malmesbury ..	..	3·14
Camp's Bay ..	..	2·19	Piquetberg ..	..	3·92
Table Mountain, Disa Head ..	..	3·25	Zoutpan ..	..	2·30
Do Kasteel's Poort ..	..	6·45	Wupperthal ..	..	2·41
Do Waai Kopje ..	..	9·07			
Do St. Michael's ..	..	8·19			
Woodstock (Hall) ..	..	3·46	IV. SOUTH-COAST :		
Do (Municipal Quarry) ..	..	4·13	Cape L'Agulhas ..	..	1·64
Do (with Niphor's Shield) ..	..	4·56	Bredasdorp ..	..	1·90
Newlands (Montebello) ..	..	10·19	Swollendam ..	..	0·90
Bishopscourt ..	..	11 51	Zuurbraak ..	..	1·52
Kenilworth ..	..	9·48	Heidelberg ..	..	0·74
Wynberg (St. Mary's) ..	..	10·14	Riversdale ..	..	0 62
Groot Constantia ..	..	7·39	Vogel Vlei ..	..	0·35
Tokai Plantation ..	..	6·02	Mossel Bay ..	..	0 18
Plumstead (Culmwood) ..	..	7·40	Great Brak River ..	..	0 22
Muizenberg (Storage Res.) ..	..	5·13	George ..	..	0·48
Fish Hoek ..	..	1·91	George (Plantation) ..	..	0 50
Simon's Town (Wood) ..	..	5·00	Woodfield (George) ..	..	0·53
Do. (Gaol) ..	..	3·41	Millwood ..	..	0 98
Cape Point ..	..	0·61	Sour Flats ..	..	0·83
Blaauwberg Strand ..	..	2 28	Concordia ..	..	1·20
Robben Island ..	..	2·01	Knysna ..	..	0·84
Maitland Cemetery ..	..	3 15	Plettenberg Bay ..	..	1·24
Tamboer's Kloof (Monte Vista) ..	..	1·28	Harkerville ..	..	2·25
			Blaauwkrantz ..	..	0·39
			Lottering ..	..	1·12
II. SOUTH-WEST :			Storm's River ..	..	0·95
Eerste River ..	..	4·00	Witte Els Bosch ..	..	1·36
Klapmuts ..	..	4·53	Cape St. Francis ..	..	1·75
Stellenbosch (Gaol) ..	..	4 83	Uitenhage (Gaol) ..	..	0·30
Somerset West ..	..	3 78	Do (Park) ..	..	0·34
Paarl ..	..	5·85	Armadale (Blue Cliff) ..	..	0·00
Wellington (Gaol) ..	..	3·01	Port Elizabeth (Harbour) ..	..	0·26
Groot Drakenstein (Weltevreden) ..	..	5·34	Do. (Walmer Heights) ..	..	0·71
Porterville Road ..	..	6·10	Shark's River (Convict Station) ..	..	0 25
Tulbagh ..	..	4·46			
Kluitjes Kraal ..	..	6·09	V. SOUTHERN KAROO :		
Ceres ..	..	12·22	Ladismith ..	..	0·61
Rawsonville ..	..	4·10	Amalienstein ..	..	0·52
Caledon ..	..	3·60	Calitzdorp ..	..	0 15
Worcester (Gaol) ..	..	2·55	Oudtshoorn ..	..	0·13
Do. (Station) ..	..	2·04	Uniondale ..	..	0 25
Hex River ..	..	2·90	Kleinpoort ..	..	0·00
Lady Gray (Div. Robertson) ..	..	1·16			
Danger Point ..	..	2·50	VI. WEST CENTRAAL KAROO :		
Vijgebooms River ..	..	8·88	Fraserburg Road ..	..	0·03
Elsenburg Agricultural College ..	..	3 90	Prince Albert ..	..	0·31
Roskeen ..	..	2·22	Zwaartberg Pass ..	..	1·45
Vruchtbaar ..	..	3 86	Beaufort West (Gaol) ..	..	0·45
			Nel's Poort ..	..	0·24
III. WEST COAST :			Willowmore ..	..	0 05
Port Nolloth ..	..	0·25	Steytlerville ..	..	0 06
Klipfontein ..	..	1·08			
Kraaifontein ..	..	0·65			
O'okiep ..	..	0·91			

VII. EAST CENTRAL KAROO: INCHES

Buffels Kloof	0·67
Aberdeen (Gaol)	0 05
Corndale	0·14
Aberdeen Road	0·13
Kendrow	0·06
Graaff-Reinet (Gaol)	0·15
Do (Eng. Yard)	0·00
New Bethesda	0·10
Glen Harry	0·16
Bloemhof	0 18
Patryfontein	0·07
Toegedacht	0 06
Klipfontein	0 00
Pearston	0·07
Darlington	0·00
Somerset East (Gaol)	0 23
Spitzkop (Graaff-Reinet)	0·09

VIII. NORTHERN KAROO:

Calvinia	0·84
Sutherland	0 82
Fraserburg	0 00
Carnarvon	0 00
Brakfontein	0·00
Victoria West	0·01
Britstown	0·00
Wilbebestkooij	0·00
Murraysburg	0 05
De Kruis (Murraysburg)	0 35
Richmond	0·10
Hanover	0·00
Theefontein	0·09
Petrusville	0·00
The Willows (Middelburg)	0·00
Middelburg	0 00
Do. (Gaol)	0·09
Jackalsfontein	0·00
Ezelpoort	0 00
Plaatsberg	0·00
Grape Vale	0·02
Ezeifontein	0·01
Rodepoort	0·02
Groenkloof	0·02
Vlakfontein	0·00
Vogelsfontein	0 00
Plaatsfontein	0 00
Colesberg	0 00
Varken's Kop	0 02
Droogfontein	0·00
Craddock (Gaol)	0·00
Maraisburg	0·00
Steynsburg (Gaol)	0 22
Riet Vlei	0·00
Tarkastad	0·14
Do. (Dis. Engineer)	0·00
Waverley	0 00
Schuilhoek	0 02
The Meadows (Schoombie)	0 00
Arundel (Colesberg)	0·02

IX. NORTHERN BORDER:

Pella	0 00
Kenhardt	0·03
Upington	0·00

IX. N. BORDER:—Continued INCHES

Trooilspan	0·00
Van Wyk's Vlei	0·00
Prieska	0 00
New Year's Kraal	0·00
Dunmurry	0·00
Karoo Kloof	0 00
Campbell	0·00
Griqua Town	0·00
Douglas	0 00
Hope Town	0·00
Newlands (Barkly West)	0·00
Barkly West	0 00
Kimberley (Gaol)	0 00
Do (Stephens)	0·00
Strydenburg	0·00

X. SOUTH-EAST:

Melrose (Div. Bedford)	1·18
Dagga Boer	0·05
Fairholt	0·17
Lynedoch	0 05
Bedford (Gaol)	0 16
Sydney's Hope	0 42
Adelaide	0 23
Atherstone	0 04
Alexandria	0 20
Salem	0·35
Graham's Town (Gaol)	0·35
Heatherton Towers	0·00
Sunnyside	0 28
Fort Beaufort	0 05
Seymour	0 28
Port Alfred	0 05
Peddle	0·18
Exwell Park	0·00
Keiskama Hoek	0 20
Oatcart (Gaol)	0 00
do (Forman)	0 00
Crawley	0 00
Thomas River	0·04
Forestbourne	0·35
King William's Town (Gaol)	0·00
Stutterheim (Besté)	0·00
Fort Jackson	0·00
Komgha (Gaol)	0 00
East London, West	0·29
Blackwoods	0·15
Albert Vale (near Bedford)	0 06

XI. NORTH-EAST:

Venterstad	0 00
Burghersdorp (Gaol)	0·00
Molteno	0·05
Lyndene	0·00
Thibet Park	0·16
Sterkstroom (Station)	0·00
Rocklands	0 05
Aliwal North (Gaol)	0·00
Carnarvon Farm	0·09
Halseton	0·00
Jamestown	0·00
Whittlesea	0·05
Queenstown (Tronk)	0·00
Rietfontein (Aliwal North)	0·00
Dordrecht	0 00

NORTH EAST:—*Continued*

	INCHES
Tylden	0·00
Herschel	0·04
Lady Grey	0·03
Lady Frere	0·06
Contest (near Bolotwa)	0·00
Keilands	0·00
Barkly East	0·01
Blikana	0·00
Rhodes	0·10
Albert Junction	0·00
Hughenden	0·00
Glenwallace	0·15
Indwe (Dis. E's Office)	0·02
Bensonvale Inst. (Herschel)	0·00
Cathcart (Queenstown)	0·00
Heatherton (Irrigation)	0·06
XII. KAFFRARIA:	
Ida (Xalanga)	0·08
Cofimvaba	0·00
Tsomo	0·00
Main	0·03
Engcobo	0·23
Butterworth	0·00
Kentani	0·07
Maclear	0·01
Idutywa	0·00
Bazeya	0·36
Willowvale	0·05
Mount Fletcher	0·00
Somerville (Tsolo)	0·00
Elliotdale	0·10

XII. KAFFRARIA:

	INCHES
Mqanduli	0·00
Umtata	0·00
Cwebe	0·41
Tabankulu	0·00
Kokstad	0·00
Do (The Willows)	0·00
Flagstaff	0·08
Insikeni	0·18
Port St. John's	0·25
Kilrush (Sneezeewood)	0·00

XIII. BASUTOLAND:

Mohalie's Hoek	0·00
Masoru	0·00
Teyateyaneng (Boreau)	0·00
Moyeni Quthing	0·00
Qacha's Nek	0·00
Leribo	0·00

XV. NATAL

Durban, Observatory	0·27
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XVII. BECHUANALAND:

Taungs	0·00
Vryburg	0·00
Sethagoli	0·00
Kuruman	0·00

XVIII. RHODESIA:

Hope Mountain	0·00
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CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 15th September, 1906, ruling at the several centres named, is published for general information:—

CENTRE.	A Wheat per 100 lb.	B. Wheat Flour per 100 lb.	C. Beer Malt per 100 lb.	D. Ma-les per 100 lb.	E. Maize Meal per 100 lb.	F. Barley per 100 lb.	G. Oats per 100 lb.	H Oat-hay per 100 lb.	J. Pota- toes per 100 lbs.	K Tobacco (Roi) per lb.	L Beef per lb.	M. Mutton per lb.	N. Fresh Butter per lb.	O. Eggs, per doz.	P. Cattle (Slaughter)	Q. Sheep (Slaughter)
Allwal North	£ s. d. 0 9 6	£ s. d. 0 18 6	£ s. d. 0 13 6	£ s. d. 0 7 5	£ s. d. 0 12 6	£ s. d. 0 7 0	£ s. d. 0 5 6	£ s. d. 0 5 6	£ s. d. 0 6 0	£ s. d. 1/6 to 4/	£ s. d. *4d to 6d	£ s. d. *4d to 8d	£ s. d. 0 1 6	£ s. d. 1 0 3	£ s. d. £8 10s to £10	£ s. d. 23 6
Beaufort West	0 13 5	0 17 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Birchardorp	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Cape Town	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Claremont	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Colesburg	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Crook	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Dordrecht	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
East London	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Grass. Reinet	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Graham's Town	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Kimberley	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
King Wm's Town	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Malmesbury	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Mossel Bay	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Port Alfred	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Port Elizabeth	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Queen's Town	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Takastad	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Vryburg	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6
Worcester	0 9 6	0 7 0	0 13 0	0 9 0	0 12 6	10	10 6	0 7 0	0 12 0	0 10	*6d to 1s	*6d to 7d	0 1 6	1 1 3	£15	23 6

NOTE.—A blank space denotes "no transactions."

* Colonial.

† Imported.

DEPARTMENTAL NOTICES.

Services of Viticulturist, Elsenburg Agricultural College.

It is hereby notified for general information that the services of the Viticulturist, Elsenburg Agricultural College, will be at the disposal of farmers in the viticultural and wine-making districts of the Colony, for advisory purposes, during the present financial year, ending 30th June, 1907, upon the following conditions:—

1. Such services to be confined strictly to viticulture and wine-making.
2. Applications for such services will be granted should they not interfere with the Viticulturist's ordinary duties at the above-named Institution.
3. Applications to be made direct to the Principal, Elsenburg Agricultural College, Mulder's Vlei.
4. Arrangements should be made by applicants for the gratuitous conveyance of the Viticulturist from the nearest Railway Station and back.
5. No charge will be made for the services thus rendered.

P. J. Du TOIT.

For

Director of Agriculture.

Regulations Governing the Payment of Grants to Agricultural Societies or Associations.

The following Regulations are published for general information:—

1. For the purpose of these Regulations an Agricultural Society shall mean any combination of persons not less than 25, organized for the purpose of holding periodical shows or prize competitions of live-stock, the produce of live-stock, agricultural produce of all kinds, and agricultural machinery and appliances; such shows or competitions to be open for the public under regulations to be framed by the Society.

2. The funds provided by Parliament for Grants to Agricultural Societies and Associations shall be applied in the following manner, and not otherwise, that is to say:—

A.—As Grants for Shows.

Every Agricultural Society may claim from any funds provided for such purpose by Parliament five-eighths (5/8ths) of the amount awarded by such Society in prizes at any show held by it; provided that such prizes have been paid in the commonly accepted classes of live-stock, the produce of live stock, agricultural produce of all kinds, and agricultural machinery and appliances.

B.—As Grants for Buildings or other Permanent Improvements to Show Grounds.

Every Agricultural Society may claim from any funds provided for such purpose by Parliament one-half of the cost actually and *bona-fide* incurred hereafter upon the construction of buildings or other permanent improvements to the Society's Show Ground.

3. Payment of such Grants may be obtained upon application to the Civil Commissioner by the Society's duly authorised Officer, who shall produce to the Civil Commissioner proof that the Society is duly qualified for a Grant under these regulations; and that payments in respect of which the Grant is applied for have been actually and *bona-fide* made by the Society, provided that in the case of Grants for Shows under sub-head A, the Civil Commissioner may, in lieu of proof that the payment has been made, accept the declaration upon oath of the President or Chairman of the Society that such and such an amount has been awarded in prizes, and will be paid to the respective prize winners upon receipt of the Government contribution.

4. In cases in which the declaration of the President or Chairman is accepted under Regulation No. 3, proof that payment has been made to all prize takers must be produced before any further payment is made on account of Grants for Shows.

Government Aid towards Tanks for Dipping Cattle.

It is hereby notified for general information that, in so far as the sum voted by Parliament in aid of the construction of Cattle Dipping Tanks during the current financial year will allow, grants will, from and after the 1st September, 1906, be made for the purpose to the extent and subject to the conditions hereunder set forth, viz. :—

1. Applications will be given consideration mainly according to priority of receipt, up to the limit of the funds available.

2. The contribution will be equal to half cost of tank and kraals; in no case, however, exceeding the sum of £60.

3. As subscribers to a Tank, the Government will accept the Divisional Council, a Municipality, a Farmers' Association, or other similar Society, or a group of Farmers owning not less than 500 cattle.

4. Subject to authority, payment will be made by the Civil Commissioner on production of proof that the required sum has been paid by the subscribers and that an amount equal to the combined private and Government contribution has been expended in building the Tank and kraals, or that work on the Tank and kraals is in progress which, when completed, will be equal in value to both the combined contributions.

5. The site of the Tank may be selected and fixed upon with the approval of the Government by the body, society or group of farmers who subscribe towards the cost.

6. The Tank and kraals must be constructed in accordance with the plan and specification, which may be obtained gratis on application, from the Chief Veterinary Surgeon, or such modification thereof as may be approved by the Chief Veterinary Surgeon.

7. Responsibility for the working of the Tank will rest with the subscribers who must, either collectively or through one or more of their number, pass a Bond on the appended Form, as a guarantee of good faith, *before payment will be made of any portion of the Government contribution.* The Bond will be required alike from any parties who make themselves responsible for the building of a Tank, with the aid of the Government grant, whether Divisional or Municipal Councils, Farmers' Associations or groups of Farmers.

(Government Notice No. 72, dated 20th January, 1905, is hereby cancelled.)

D. HUTCHEON.

Director of Agriculture.

FORM OF BOND.

KNOW ALL MEN BY THESE PRESENTS

That I
 we
 of (address)
 representing the
 am held and firmly bound to the Secretary for Agriculture, as representing the Govern-
 are ment of the Cape of Good Hope, in the sum of One Hundred Pounds sterling (£100),
 to be paid to the Secretary for Agriculture for the time being, for which payment, to
 be well and truly made, ^{I, my} we, ^{our} heirs, executors administrators and assignees are each
 of us bound, jointly and severally, *in solidum*, by these presents.

Whereas the Government has granted us the sum of £... towards the
 cost of erecting and maintaining a public dipping tank at
 upon the conditions hereinafter contained :

Now, therefore, the condition of the above written bond is such that if we shall at
 all times hereafter well and faithfully observe and keep all and every the conditions
 and agreements hereinafter set forth, then the above written bond shall be void,
 otherwise the same shall remain in full force and effect :—

1. We hereby guarantee and undertake that the Tank, together with dipping
 ingredients and a responsible attendant shall be in readiness for those entitled to its
 use at all reasonable hours on dates to be notified by those responsible for the working
 of the Tank.

2. We guarantee the charges to be made for the use of the Tank shall not exceed Three Pence a head for horses and cattle, and One Penny a head for small stock.

3. We undertake that the formula and standard of Dip to be used in the tank shall conform with the requirements of the Chief Veterinary Surgeon.

4. We undertake not to part with the ownership and control of the Tank without the consent in writing of the Secretary for Agriculture being first obtained.

In witness whereof we have hereunto set our hands at..... 190..., in the presence of the subscribing witnesses.

(Name)

(Address)

(Name)

(Address)

As Witnesses :

(Name)

(Address)

(Name)

(Address)

Collection of Wax Berries, Cape Flats.

It is hereby notified for general information, that the undermentioned tariff will be in force from and after the date hereof in respect to the collection of Wax Berries from such portions of the Cape Flats where sand drifts have become fixed, viz., 2 6 per head per week. Applications for licences should be made to the District Forest Officer and Foresters, Cape Flats

J. STORR LISTER,
Acting Chief Conservator of Forests.

African Coast Fever.

Under Proclamation No. 312, dated September 8, 1906, His Excellency the Governor formally notifies:—

Whereas by my Proclamation No. 206, bearing date the 30th day of June, 1906, I did regulate the introduction into this Colony of Horned Cattle from the Colony of Natal by reason of the existence of the disease amongst cattle, known as African Coast Fever, in certain portions of that Colony :

And whereas, owing to the spread of the said disease, it has been shewn to me to be expedient to repeal the Proclamation aforesaid and to make other provision in lieu thereof:—

Now, therefore, under and by virtue of the powers vested in me by the provisions of Acts No. 9 of 1876 and 27 of 1893, I do hereby proclaim, declare, and make known that, whereas the disease known as African Coast Fever exists amongst cattle in the Colony of Natal, it shall not be lawful, from and after the date of promulgation hereof, to introduce or cause or allow any Cattle, animal produce or grass-hay to be introduced from the said Colony of Natal into this Colony.

And I do hereby proclaim and make known that any person who shall introduce or cause or allow such Cattle, animal produce or grass-hay to be introduced, or permit such Cattle to stray into this Colony from Natal, shall be deemed to be guilty of contravening the provisions of this Proclamation, and shall be liable to the penalties provided for such contravention by the said Acts Nos. 9 of 1876 and 27 of 1893 respectively; and that all such cattle, animal produce or grass-hay as may enter this Colony from Natal in contravention of this Proclamation shall be liable to be destroyed.

And I do strictly charge every Resident Magistrate, Field-cornet, Justice of the Peace, and Inspector of Native Locations to see that this Proclamation is obeyed, and to bring to justice any person who may contravene the same.

Proclamation No. 206, dated the 30th June, 1906, is hereby cancelled and

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town. Members of Farmers' and Fruit Growers' Associations applying for same through the Secretaries of these Associations are supplied free of charge.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V of *Agricultural Journal*.

Artificial Grasses and Fodder for Stock; Ensilage; Treatment of Cereals and other Crops; Viticulture and Wine Making; Forestry; Locusts and their Destruction; Possible New Industries for Cape Farmers; Stock Farming; Dairying; Fruit Culture (6d.)

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Brak Land in Relation to Irrigation and Drainage (1d.); The Velvet Bean (1d.); Potato Disease (1d.); Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d.); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (3d.); The Salt Bushes (1d.); Tobacco Culture by P. Bornemisza (1d.); The Cultivation of Tobacco in the Colony by K. Schenck (3d.); Tobacco Will in Kat River Valley (1d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d.); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); †Dairy and its products by D. Hutcheon (2d.); *Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Cabbage Aphis (1d.); Codling Moth in Madeira Fruit (1d.); *Codling Moth (1d.); Fruit Fly (1d.); Fumigation Supplies (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d.); *Peach Yellows (1d.); Pear Slug, Paris Green (1d.); Remedy for Mestwurmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.); Scale Insects on Ornamental Trees and Plants (1d.); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordenaux Mixture (1d.); Deaths Head Moth Superstition (1d.); Fumigation under Box Covers (1d.); The House Fly (1d.); New Oak Tree Pest (1d.); Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.); Another Introduced Scale Pest (1d.); Washes for Red Scale (1d.); Fruit Fly: Peach Fly (1d.); Lime-Sulphur-Salt Wash for Scale Insect (1d.); The Fruit Moth (1d.); Fusicladium of the Apple and Pear (1d.); Mealy Stalk Borer (3d.)—coloured plate; Cleaning up Nursery (1d.); Natural Enemies of the Fruit Fly: Report on Investigations in Brazil (1d.); Locust Birds and Locust Poison (1d.); The Brazil Fruit Fly Parasites (1d.); Cyanide Gas Remedy for Scale Insects (3d.); Arsenate of Lead (1d.)

Forestry.

British National Forestry (1d.); Botanical Observations on Forests in Eastern Pondoland (1d.); †Elementary Principles of Sylviculture or Woodcraft (1d.); National Forests (1d.); Indigenous Timbers of the Cape (1d.); Misuse of Coal and the Uses of Forests (1d.); Tree Planting for Timber and Fuel (1d.); Tree Planting for Farmers (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Fisheries.

Trout and Carp Breeding and Stocking of Streams (1d.); *Methods of Preserving Fish by Smoking (1d.); Portable Floating Hatching Box for Trout Ova (1d.)
The Protection of Trout (1d.); The Ocean and its Resources (1d.)

Horticulture

Fruit Culture in the Gamtoos River Valley (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (6d.); The Olive at the Cape (2d.); Tomatoes and Fruit for Export (1d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.); *Fruit from Orchard to Buyer (1d.)
Netting for Fruit Trees (1d.); Fruit Culture in Argentina (1d.); Vegetables for Exhibition (1d.) Chrysanthemum Rust (1d.)

Veterinary and Animal Industry.

*Anthrax, Charbon, Miltzbrand or Miltziekte (1d.); *Heartwater (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d.); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstock's Report on Inoculation for Rinderpest (1d.); *Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.); *Sheep and Wool (1d.); The Eye and its Diseases (1d.); Flusk, Loose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhoea in Calves (1d.); Persian Sheep and Heartwater (1d.); Poisoning of Stock (1d.); Retention of the Foetal Membrane, or Afterbirth in Cows (1d.); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Tuberculosis and the Use of Tuberculin (1d.); African Coast Fever with Description of Dipping Tank (3d.); *Rinderpest in South Africa (3d.) by D. Hutcheon; *Fluke or Slak in Liver of Sheep (3d.)—*coloured plate*; *Anthrax or Miltziekte and Quarter Evil or Sponsziekte (1d.); Osteo Porosis (3d.)—*coloured plates*; *Glanders (3d.)—*coloured plate*; *Animal Castration (1d.); *Preventive Inoculation for Redwater (1d.); *Abortion in Cattle (1d.); Treatment for Worms in Domestic Animals (1d.); *Lungsickness of Cattle, Contagious Pleuro-Pneumonia, or Pleuro-Pneumonia-Bovum-Contagiosa (1d.); *Swine Fever, Hog Cholera or Pig Typhoid (3d.)—*coloured plates*; Castration of Females and Animals other than the Horse (1d.); Poisoning of Horses by *Ornithogalum Thyrsoides* or Chinkerinchee (*coloured plate*) (3d.); Diseases of the Horse and their Treatment (1s.); Horse Sickness by D. Hutcheon (2d.); Ticks and African Coast Fever (1d.); Cirrhosis of the Liver in Stock (1d.); Liver Disease among Calves (3d.); The Arsenite of Soda Dipping Mixture (1d.); *Lampas.

Viticulture.

†Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d.); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d.); Manufacture of Dry Wines in Hot Countries (3d.)

Miscellaneous.

Game Seasons (3d.); Land Laws of Cape Colony (1d.); †Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c. 1d.; Bars in Ostrich Feathers (1d.)

NOTE.—All those marked * are obtainable in Dutch and English.

† Dutch only.

R. MÜLLER, 77, STRAND STREET, CAPE TOWN,

Pays HIGHEST prices for:—

**WOOL, OSTRICH FEATHERS,
MOHAIR, SKINS, HIDES,
and other PRODUCE.**

R. MÜLLER, Cape Town,

Supplies **Best MERINO RAMS and EWES.**

Bankers : African Banking Corporation.

P.O. Box No. 133. Telegrams : **RELLUM**, Cape Town. Telephone No. 180.

R. MÜLLER,
77, Strand Street, CAPE TOWN.

Wall Papers ! Paints !

The most artistic selection in South Africa to select from. Wall Papers, Lincrusta Walton, Anaglypta, Papier Mache Cornices, Centres, etc.

White Lead, Paints, Oils, Varnishes, etc.

All goods warranted best quality. Lowest market prices.

Sole Agents for DURESCO the famous Washable Distemper, better than Oil Paint on new plaster, and specially suitable for Farm Buildings. Will stand storm or sunshine.

Samples and Price Lists on Application.

SMYTH & CRAWFORD,
35, Wale Street, CAPE TOWN.

(One Door above Loop Street.)

THE PRODUCE MARKET.

CAPE TOWN.

Mr. R. Müller, of Strand Street, Cape Town, supplies the following report for the month of September:—

Ostrich Feathers.—The next London Sales open on the 2nd and it is expected that about £200,000 value will be offered. There is little change to report in our market. Superior pluckings realise full value and a good demand exists, particularly for good quality Whites, Feminas, Long Blacks, Long Drabs, and Spadmas. So far as indications go, prices are expected to keep steady.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
Super Primes	10	0	0	35	0	0	Floss ..	0	5	0	1	10	0
Firsts, Ordinary							Long Drabs ..	2	10	0	4	10	0
to Super ..	8	0	0	10	0	0	Medium Drabs ..	1	5	0	2	0	0
Seconds ..	5	0	0	7	10	0	Short to Medium	0	10	0	1	10	0
Thirds ..	3	10	0	4	10	0	Floss ..	0	2	6	1	10	0
Femina (super)	7	10	0	9	10	0	White Tails ..	1	15	0	3	0	0
Femina, Seconds							Coloured Tails ..	0	10	0	1	15	0
to Firsts ..	4	0	0	6	10	0	Chicks ..	0	1	0	0	2	0
Byocks (fancy) ..	5	0	0	7	10	0	Spadonas ..	2	10	0	4	0	0
Long Blacks ..	4	10	0	7	10	0	Inferior Black &						
Medium Blacks	3	0	0	3	10	0	Drabs, Short						
Short to Medium	0	10	0	2	10	0	to Long ..	0	0	6	1	10	0

Wool.—A few lots of new season's wool have been offered. Light Karoo Grease suitable for combing, realised from 6½d. to 7½d.; Medium Long, from 5½d. to 5¾d.; Inferior Description, 4½d. to 5d. A small parcel of Super Light Grassveld was sold for 8½d. Light Roggeveld wool realized 7½d. for a clip of 14 bales. Very few Snowwhites have been offered. Extra Super Paarl may be quoted up to 1s. 8d. Ordinary to Super from 1s. 3d. to 1s. 5d. Seconds from 1s. to 1s. 2½d.

	s.	d.	s.	d.	s.	d.	s.	d.
Super Long Grass Veld					Short and Inferior	0	4	0 4½
Wool	0	8	0	9½	Wool for Washing	0	4½	0 6
Super Long Karoo Veld					Snow-white Super to Extra	1	7	1 10
Wool	0	6½	0	7½	Ordinary	1	1	1 6
Medium Karoo Veld Wool	0	5	0	5½	Fleece Washed	0	0	0 9½

Mohair.—The market remains unchanged. There is little doing in Summer Firsts and Kids. Winter Hair has changed hands at prices ranging from 11d. to 11¾d. according to quality. Trade at Home appears to be in a satisfactory condition, and it is not expected that there will be much change in prices.

	s.	d.	s.	d.		s.	d.	s.	d.
Mohair, Firsts, Summer	1	1	1	3½	Mohair Winter	0	10½	1	0
Kids	1	3	1	7	Kids	1	0	1	3
Seconds	0	6½	0	9½					

Long Wool and Short Wool Skins sold at from 6½d. to 6¾d., and 6d. to 6½d. respectively.

PORT ELIZABETH.

Messrs. J. Daverin and Co., report under date September 21:—

Ostrich Feathers.—The market was again heavily supplied this week with a fair average assortment. Competition was active, and extreme prices were paid for all descriptions, Feminas and Spadmas showing some advance. A fair amount of business has also been done out of hand at full rates. Among the large and valuable consignments sold by ourselves this week was a fine plucking from the camps of D. J. de Wet, Esq., of Prospect, Ashton (Worcester). These feathers were much admired by buyers, being well grown, and having broad and rich flue. They excited keen competition and realized very extreme prices. The total quantity sold on the public sales this week weighed 4,258 lbs., and realized £10,910 12s. 1d. The next London sales open on the 8th proximo.

	£	s.	d.	£	s.	d.
Primes : Extra super				Special Prices.		
Good to super	12	0	0	14	0	0
Whites : Firsts	9	0	0	12	0	0
Seconds	6	0	0	8	0	0
Thirds	3	0	0	4	10	0
Feminas :						
Super	10	0	0	14	0	0
Firsts	5	10	0	9	0	0
Seconds	4	0	0	5	0	0
Thirds	2	10	0	3	0	0
Greys	4	10	0	6	10	0
Fancy	5	10	0	8	10	0
Tails : White	1	10	0	4	0	0
Light	0	17	6	3	0	0
Coloured & Dark	0	5	0	1	2	6

	£	s.	d.	£	s.	d.
Blacks : Long..	3	10	0	6	0	0
Medium	1	15	0	3	0	0
Short	0	10	0	1	0	0
Wirey	0	1	0	0	1	0
Floss	0	6	0	1	15	0
Drabs : Long ..	1	15	0	3	0	0
Medium	0	12	6	1	0	0
Short	0	2	6	0	6	0
Wirey	0	0	6	0	1	0
Floss	0	6	0	1	15	0
Spadonass :						
Light	2	0	0	5	10	0
Dark	0	12	6	1	15	0
Chicks	0	0	3	0	1	6

Wool.—The Antwerp sales took place this week, Morinos showing a decline of 5 per cent. Our market continues firm for all new season's long Wools in good condition, for which extreme prices are obtainable, but for sandy lots the demand is dull, and sales are only effected with difficulty. Old Wools are entirely neglected, and to make sales low prices have to be accepted. The London open on Tuesday next, the result being anxiously awaited by both buyers and sellers. On yesterday's public market a limited quantity was offered, prices showing no change.

Snowwhite Extra

Superior	19½d	20d
Snowwhite Superior	17½d	19d
Do Good to Superior	16½d	17d
Do Inferior Faulty	16d	16½d
Grease, Super Long, well-conditioned, Grassveld grown (special clips)	8½d	9d
Grease, Super Long, well-conditioned, Grassveld grown	6½d	7½d
Grease, Super Long, well-conditioned, Karoo grown (special clips)	7d	7½d
Grease, Super Long, well-conditioned Karoo grown	6d	6½d
Grease, Super Long, well-conditioned, Mixed Veld	5½d	7d
Grease, Light, faultless, medium, Grassveld grown	5½d	6½d
Grease, Light, faultless, Karoo medium grown	5½d	6d
Grease, Light, faultless, short Karoo grown	5½d	

Grease, Short, faulty

and wasty	5d	5½d
Grease, Coarse and Coloured	4½d	4¾d
Scoured, Coarse and Coloured	6½d	12d
Basuto Grease, short..	6d	6½d
O. R. C. Grassveld Grease, long and well-conditioned (special clips)	6½d	7d
O. R. C. Grassveld Grease, long and well-conditioned	5½d	6½d
O.R.C. medium grown, light, with little fault	6d	6½d
O.R.C. short, faulty and wasty	5d	5½d
O.R.C. Karoo grown, long and well-conditioned	5½d	6½d
O.R.C. medium grown, light, with little fault	5d	6d
O.R.C. short, faulty and wasty	4½d	5d

Mohair.—At present there is no enquiry for either Summer Firsts or Kids, but a steady demand exists for Winter Hair and Kids at full current prices. We would again impress upon farmers and storekeepers that Mixed Winter Kids will only bring the same price as ordinary Winter Hair. On the public market on Tuesday a small quantity was offered, and prices showed no change as compared with last week's.

Super Kids	1s	6½d	1s	7d
Ordinary Kids	1s	4d	1s	5d
Superior Firsts, special clips	1s	3½d	1s	3½d
Ordinary Firsts	1s	3d	1s	3½d
Short Firsts	1s	1d	1s	1½d
Superfine Long Blue, O.R.C. Hair	1s	2d	1s	3d

Mixed O.R.C. Hair

(average)	0s	11½d	1s	0½d
Do. Very Mixed	0s	10½d	0s	11d
Seconds and Grey	0s	8d	0s	9d
Thirds	0s	6½d	0s	7d
Winter Kids	1s	2d	1s	2½d
Do. Hair	1s	0d	1s	0d

Skins.—Skins are rather lower. Sheepskins in bundles sold at 6½d. per lb.; Pelts at 5½d.; Capes, 2s. 1d.; damaged, 7d. each; Angoras, 7½d.; Shorn, 5½d.; damaged, 3½d.; Goat, 11½d.; damaged, 5½d. per lb.; Springbok, 8d. each.

Hides.—This week Sundried Hides sold at 8d., and damaged at 6d.; Drysalted 7½d., damaged 5½d., and Thirds 3½d.

Horns.—Parcels all round sold at 3½d. each.

Market Report for Month of September, 1906.

By THE COMMERCIAL AGENT OF THE AGRICULTURAL DEPARTMENT.

Local trade is still very quiet, although the up-country trade has and is improving.

Enquiries are being made by traders to be put into direct touch with the producer, for the coming season's crops. Will farmers please note, and send their names, addresses, in particulars of the kind of produce grown by them, to be filed for reference, and readiness for trade enquiries? It is found that many farmers are at a loss to know the various charges for the conveyance of their produce by rail and steamer, to and from the Coast ports and to other S.A. Colonies. This information is tabulated in this Department, and will be furnished to all enquirers free.

Since last month the most notable market change is the advance of Imported Butters from 1/3 to 1/4½ per lb. for first quality. Eggs, owing to increased supply, have dropped from 13/6 to 10/- per 100. Oathay has dropped from 4/9 to 4/- and 4/3. Potatoes are a little easier. Onions are the same, but incline upwards.

The imported butter trade has experienced a steady rise, prices quoted being 1/3½ to 1/4½ according to quality. There is now a chance for the Colonial Creamery butters, which are quickly assuming a better quality, texture, and flavour, to compete in price with the imported article. It is pleasing to note that special endeavours are being made by the wholesale and retail traders to give preference where possible for the Colonial article. Colonial produce of all kinds is in demand, and is gaining popularity on account of the improved quality and packing. During this week the following items have been placed:—

Milk, fresh eggs, fresh Colonial Creamery butter, a few sheep, a number of excellent pigs, oathay, barley, lucerne, fresh Colonial onions, beans.

Enquirers are asking for Colonial farm-cured bacon, good fowls, 200 dressed geese for Christmas, pale cured and light medium coloured tobacco leaf, ostrich eggs, colonial cheeses, Natal dried and sugar beans, wheat and oats.

Offered by producers:—Lucerne hay, oathay, onions, charcoal, Creamery butter, fancy soft cheeses, sucking pigs, fowls, turkeys, veal, beans, milk, cream, fresh eggs and potatoes.

Any producer desirous of opening up business relations with the trade, or any traders desirous of being brought into contact with the producer, if they will communicate to this Department their requirements, an effort will be made to arrange mutual business relations.

PORK.—A Creamery offers Colonial fed in lots to suit purchasers. This pork is reliable and of the finest quality and flavour.

PIGS.—A farmer offers 10, averaging 100 to 150 lbs. live weight, 4d. f.o.r. Another farmer offers 4, about 120 lbs., and 3 averaging 200 lbs. live weight, splendid condition; also 150 on offer.

MEAT.—**COLONIAL MUTTON:** Demand good, quality good; dressed carcasses, 5½d. to 6½d. per lb. Imported mutton, dressed carcasses, 5d. per lb. **COLONIAL BEEF:** dressed carcasses, 5d. to 5½d. per lb. Stock of imported beef and mutton is diminishing. Retailers state that there is an increased demand for Colonial meat. There is a genuine endeavour being made by the larger firms and retailers to push Colonial meat.

MILK.—Retail price from 3½d. per bottle; wholesale 3d. Large quantities of milk are offered at 1/3 per gallon delivered Cape Town or Suburban stations.

FRESH MILK PASTEURISED.—The popularity of this article is steadily on the increase. 200 bottles are offered daily delivered Cape Town or Suburban Stations, 1/3 per gallon.

CHEESE.—Imported cheese, Canadian 10d. to 10½d. Goudas or sweet milk 9½d. to 10½d. less 5 per cent.

COLONIAL MADE ENGLISH CHEDDAR.—Samples have been submitted. The quality, texture and flavour is equal, and I am inclined to say superior, to any imported cheese. New season's will be made during October.

DRIED FRUITS.—Very little offering and that of inferior packing with the exception of Colonial prunes. The quality and got up are in all respects superior and cheaper than the imported article. Nearly two tons have been placed this week. Traders please note. Equal to the best Californian. Dark coloured flat pears sold at 4½d. 5d. and 6d. A poor quality of peeled peaches offer at 6d.

POULTRY.—Fair supply. Fowls, small 1/6; medium, 2/6; large, 3/3. Ducks, medium, 3/- to 3/3; large 3/6. Hen Turkeys, lots sold 4/6, 6/- and 6/6; Cock Turkeys small, 7/- to 8/6; large 11/- to 14/9. Goose, small, 3/6; large 5/3. Calves 18/- to 25/. Ostrich eggs 1/3. Sucking pigs, lots sold 8/-, 10/- and 12/- each.

COLONIAL OATHAY.—Plentiful supply, wholesale lots for 3/10½ to 4/3, country stations, according to quality and proximity to Cape Town.

CUT COLONIAL HAY.—4/3 to 4/7 wholesale lots country stations retail delivered to store 4/9 to 5/- according to quality.

COLONIAL OATS.—Market quiet, prices 11/- to 11/6 f.o.r. country stations, parcel offering Piquetberg 11/-.

LUCERNE HAY large quantities are now being offered. Prices for wholesale quantities 6/6 to 6/9 per 100 lbs. Retail from 7/- to 7/3 according to quality. The quality, colour and packing is satisfactory.

COLONIAL BARLEY.—Worcester 11/6. demand fair, 11/3 to 11/9 offered for bags 150 lbs. f.o.r. country stations wholesale lots, according to quality and proximity to Cape Town. Retail 12/9 to 13/- per bag delivered.

IMPORTED BARLEY.—Demand fair, 12/- to 12/6; per bag 150 lbs. Colonial bran 6/6 and 6/7½, f.o.r. country stations close proximity to Town.

COLONIAL RYE.—Scarce. Demand good, none offering. There are several buyers for Colonial rye. Will farmers please note? Imported rye ex store 13/- to 19/6 per 200 lbs.

COLONIAL COMPRESSED FODDER.—Wholesale quantities delivered, Cape Town 5/6 to 5/7½, per 100 lbs. Sample received from the South African Fodder Co., Malmesbury is packed equal to the best imported. It is a good sound wholesome food, free from dust and ought to command a ready sale.

CAPE COLONIAL WHEAT.—Most millers fairly well stocked. Demand small, a prices asked. Price trifle easier, 17/3 to 17/9, f.o.r., country stations. A large buyer desires quotations for quantity.

NATAL WHITE COAST MEALIES.—None offering this week, price ex store wholesale lots 14/6 to 15/-

NATAL YELLOW MEALIES.—Prices firm. Few offering at 13/9 to 14/- c.i.f., 14/7½ to 15/- ex store delivered.

NATAL MIDLAND WHITE MEALIES.—None offering.

SMALL IMPORTED MEALIES.—There is a greater demand than ever for the small mealie owing to the increased interest in poultry farming. It would be well for our Colonial farmers to cultivate this class of mealies as the demand is on the increase. Price River Plate delivered ex store 15/3 to 15/10½ per 200 lbs. Market firm.

CHICORY.—Colonial dried root. A buyer offers £12 10s. per ton., will growers please note and send samples?

TOBACCO.—There are numerous buyers for the pale yellow leaf. Will growers please send samples of the above or any good quality leaf of the light medium colour?

VEGETABLES: Plentiful and cheap. Cauliflowers plentiful this week; small, 1/-; large, 2/- and 3/- per doz. Cabbages, small, 6d. and 9d.; large, 1/- per doz. Carrots, 6d. per doz. bunches. Parsley, 6d. per doz. bundles. Radishes, 3d. per doz. bundles. Beetroot, 9d., 1/-, and 1/9 per doz. bundles.

FRUIT.—Loquats, 3d., 4d., 6d., and 9d. per 100. Naartjes per 100, not very plentiful, small, 2/-; medium, 4/- to 5/-; large, 8/- to 9/-. Guavas per 100, small, 1/-; medium, 1/6; large, 3/-. Lemons, Cape, 1/- to 2/- per 100. Oranges per 100, medium, 2/- to 3/-; large, 5/- to 7/6 and 9/6. Limes, 3/-, 4/- and 5/6 per 100. Colonial apples, none offering. Bananas, per 1,000, 15/- 18/- 20/- and 25/-, according to quality and size. Pineapples, none offering. Colonial oranges are not too plentiful, but the quality is very good. Supply of bananas is not in excess of demand, with the result that prices are higher. I cannot emphasize too strongly the necessity of farmers grading their fruit. The practice of sending consignments of mixed grades results generally in the small sizes being all at the bottom, and a few choice selections at the top. The percentage of small fruit being out of all proportion to the value paid for the supposed fair sample shown on top. This is disastrous to the farmer, as, the buyer, once taken in, offers a price based on the assumption that "to buy a pig in a poke" requires a large margin for contingencies. In conversation with the leading market agents *re* grading of fruits, they affirm that if three cases of mixed fruits were graded into, say, three different sizes of one case each, that the resultant price would be at least 10 to 20 per cent. more than when not graded. I trust those interested in the despatch of fruit will please note.

BEANS.—Dried beans very scarce. Farmers offering at high prices. Natal and sugar beans very scarce. Lots sold at 42/6, but cannot for the moment replace.

POTATOES.—Supply equal to demand. Western Province lots sold, first quality, 14/- to 16/- per bag, 150 lbs. Eastern Province, a few sold at 13/6. Imported, 7/6 to 8/3 per 75 lb. box, according to size and quality.

SWEET POTATOES.—Supply equals demand. Firm price. Lots sold at 6/6, 7/6, and 8/6 per bag of 150 lbs. Quality excellent. Inferior quality, 4/- to 6/-.

ONIONS.—Supply only equals demand. Small pickling, 3/-, 4/-, and 5/- per bag; first quality, 6/6, 7/6 and 8/6 per bag; second quality, 3/- to 5/- per bag of 125 lbs. A large buyer wants small pickling onions.

COLONIAL-MADE COULOMMIER CHEESE.—Weight about 1½ lbs., 13/- per doz. Colonial Gervais of the finest quality, 3/- per doz., less 5 per cent.

COLONIAL CREAM CHEESE.—Orders for 750 weekly placed for this excellent product. The quality is equal to the best Devonshire, price 4/3 per doz., delivered at Cape Town and suburban stations.

Return of Fruit Shipped to England from Cape Ports,

DECEMBER, 1905, TO AUGUST, 1906.

Variety of Fruit.	Number of Packages.		Quantity Number.		Declared Value.		
	1905.	1906.	1905.	1906.	1905.		1906.
<i>December.</i>					£	s.	d.
Peaches ..	149	894	2,430	16,766	24	0	0
Plums ..	52	74	1,100	1,340	11	10	0
Apricots ..	103	619	2,060	19,740	24	0	0
					59	10	0
<i>January.</i>					£	s.	d.
Peaches ..	639	4,432	11,470	107,842	156	7	0
Plums ..	1,658	6,386	36,546	148,028	414	10	0
Apricots ..	209	240	6,040	4,910	74	15	0
Nectarines ..	48	395	961	9,571	12	0	0
Pears ..	28	1,776	500	37,026	7	0	0
Grapes ..	..	89	..	1,332 lbs.	..		
Pineapples ..	..	16	..	460	..		
					664	12	0
<i>February.</i>							
Peaches ..	1,865	1,565	24,441	38,148	473	9	0
Plums ..	2,392	6,008	57,097	42,600	587	12	6
Apricots ..	..	3	..	75	..		
Nectarines ..	355	547	5,829	12,030	89	4	0
Pears ..	2,773	961	50,256	232,626	706	5	0
Tomatoes ..	12	..	176	..	1	15	0
Grapes ..	227	5,881	1,279 lbs.	93,365 lbs.	77	15	0
Apples ..	37	95	1,125	1,765	9	5	0
Melons ..	8	84	..	84	..		
Pineapples ..	..	24	..	720			
					1,945	5	6
<i>March.</i>							
Peaches ..	265	243	5,260	4,880	56	16	0
Plums ..	2,238	183	48,366	4,050	546	6	0
Apricots ..	1	..	25	..	0	5	0
Nectarines ..	1	..	20	..	0	5	0
Pears ..	1,690	1,928	37,113	36,145	432	9	0
Tomatoes ..	6	..	120	..	1	5	0
Grapes ..	5,437	7,333	118,404 lbs.	120,225 lbs.	1,820	10	3
Melons ..	8	..	30	..	3	18	0
Apples ..	85	13	1,700	260	23	5	0
Quinces ..	4	..	169	..	1	0	0
Grenadillas ..	1	..	50	..	0	2	0
					2,886	1	3
					2,073	12	1

Return of Fruits Shipped to England from Cape Ports, December 1905 to August 1906.--(Continued).

Variety of Fruit.	No. of Packages.		Quantity Number.		Declared Value.	
	1905.	1906	1905.	1906.	1905.	1906.
<i>April</i>					£ s. d.	£ s. d.
Pears ..	543	6,036	10,950	120,720	138 18 0	1,147 8 0
Persimmons ..	1	...	25	..	0 5 0	0 0 0
Quinces ..	29	22	434	440	4 10 0	4 8 0
Apples ..	16	1	380	12	4 12 0	0 1 0
Pineapples ..	19	..	228	..	7 0 0	0 0 0
Grapes ..	1,533	1,793	20,370 lbs.	24,146 lbs.	391 6 3	311 12 0
					546 11 3	1,464 5 0
<i>May</i>						
Pears ..	14	..	280	..	3 10 0	0 0 0
Pineapples ..	4	115	160	3,580	2 10 0	27 0 0
Guavas ..	1	..	100	..	1 0 0	0 0 0
					7 0 0	27 0 0
<i>June</i>						
Pears ..	..	50	..	1,000	0 0 0	9 15 0
Apples ..	..	1	..	20	0 0 0	6 5 0
Oranges ..	..	2	..	160	0 0 0	0 15 0
					0 0 0	10 15 0
<i>July</i>						
Oranges ..	6	6	..	600	0 0 0	5 10 0
<i>August</i>						
Oranges ..	6	6	..	1,350	0 0 0	6 0 0

BREEDERS' DIRECTORY.

Notices under this heading are inserted at the rate of one penny per word per issue; minimum charge 2s. 6d. Payment must accompany order. Six consecutive insertions 10% discount; twelve 15% discount. Cheques and P.O.O. to be made payable to the Accounting Officer, Department of Agriculture, Cape Town.

HORSES.

Hugh A. Wyndham, Kromdraai Stud, near Standerton, Transvaal. Stud Stallions, Season 1906-1907. Broxton, d.b.h., 15-8. He is very well bred, being by Ayreshire, winner of the Derby, out of Farewell, winner of the 1,000 guineas, by Doncaster, winner of the Derby, out of Lily Agnes, dam of Ormonde, winner of the Derby, her dam Polly Agnes by the Cure—Miss Agnes by Irish Birdcatcher. Thoroughbred mares, £10 10s.; limited number of approved mares, £5 5s.

Narhillah, ch. h., 15 hands, by Baliol, out of Little Nell, by Lammernoor. He won several steeplechases in England, and ran seventh in the Grand National in 1904. Thoroughbred mares, £7 7s.; approved mares, £3 3s.

CATTLE.

SHORTHORNS.

Turpin, Geo. W., WATERFORD, KUBUSIE STATION, CAPE COLONY. Breeder of Pedigree Lincoln Red Shorthorn cattle. Young bulls always for sale.

JERSEYS.

Thoroughbred Herd. Celebrated Island bred bull "Clove," and several of the best cows and heifers from Mr. H. W. Struben's late herd. Mrs. A. A. Dunn, De Tuin, Piquetberg.

FRIESLANDS.

Pure Frieslands. Enquire for cows, young bulls, and heifers. Oldest pure herd in Eastern Province. Grand milkers. Prize stock. Also, Colonial Rambouillet Flock Rams, limited number.—F. F. WIENAND, Bellevue, Bedford, C.C.

R. Cross, HILLSIDE, P.O. BOLOTWA. Will have high-class Friesland bulls for sale from February next. Herd may be seen by appointment. Bulls from Imported and Colonial Cows.

Cattle—continued.

DEVONS.

Varkens Kop Herd of Pedigree Devons, quality, size, rich milk, very hardy, many prize winners. Cows, Heifers and young Bulls for sale. Ostriches, bred from best strains in South Africa; pairs for sale. Horses, "Typical South Breed," untrained colts for sale. W. R. SOUTHEY, Varkens Kop, Schoombie, C.C.

SHEEP.

MERINOES.

T. T. Hoole, ATHERSTONE, ALBANY. Breeder of PURE HENGALIAN PEDIGREE MERINOES. Late imported. *King Billy 39th*. Grand Champion. Champion and First, National Association, Brisbane, 1904. First Prize, family group and winner of ten other first prizes.

A. H. Murray, PORTLOCK, GRAAFF-REINET. Breeder of Rambouillet Sheep. Good combination of mutton and wool. Rams for sale from £8. Orders now booked for past season's lambs, to deliver 1907.

Rambouillet Rams, from Colonial Ewes, by Imported and Colonial sires. Sold at all Bedford Ram Fairs. Partridge Wyandottes and Indian Runner Ducks' Eggs.—PRINGLE Bros., Glen Thorn, P.O. Linton, Adelaide.

OSTRICHES.

Specials only. Chicks, £5 to £20 each; Young Birds, £10 to £30.—F. W. BAKER, Laughing Waters, Willowmore.

GENERAL.

H. Vermaak, The Pines, Maraisburg, Cape Colony, has on hand and for sale at very reasonable prices, PURE-BRED FRIESLAND BULLS and PURE-BRED MERINO RAMS of the RAMBOUILLET breed.

THOROUGHBRED PERSIAN RAMS and OSTRICHES.—Hougham Abrahamson, Long Hope Siding, C.C. Breeder of Rams from progeny of ewes passed into Stud Book of Cape Breeders' Association. Also selected Breeding Ostriches.

General—continued.

PASPALUM GRASS PLANTS.—Quotations for plants, in bags free on rail Stellenbosch (keep moist long distance). See *Agricultural Journal*, May, 1906, page 622, or from A. C. BULLER, Dwarsriviershoek, Stellenbosch.

W. Bullen, P.O. Box 1354, Cape Town. Breeder and Importer of Game, Houdans, Leghorns, Orpingtons, Wyandottes, Ducks, Geese, Homing and Fancy Pigeons at lowest prices (all risk taken).

PURE BRED ANGORA GOAT RAMS.

Bred from the Choicest Strains, and Prize-winners at the leading Agricultural Shows of Cape Colony. For particulars apply to A. B. Houson, Martynsford, Jansenville.

PERSIAN SHEEP AND OSTRICHES.

S. Montague Gadd, SPRINGFIELD, TAFELBERG. Orders booked for young rams, from Stud-book Ewes and for Ostrich Chicks from the best strains in the country.

THE POULTRY YARD.

PRIZE and UTILITY POULTRY of the BEST ENGLISH and AMERICAN STRAINS.—WHITE WYANDOTTES—PARTRIDGE WYANDOTTES—SILVER-PENCILLED WYANDOTTES—BARRED PLYMOUTH ROCKS—WHITE LEGHORNS—BROWN LEGHORNS—BUFF LEGHORNS—WHITE LA BRESSE. Stock and SETTINGS OF EGGS FOR SALE. Correspondence invited.—S. SMITH, Talana, Wellington Avenue, Wynberg.

Geo. E. Barrett, P.O. Box 964, CAPE TOWN. Importer of Poultry, Pigeons, Cage Birds and Appliances of every description, from Wicks Bos., Norwich. Trial solicited and Catalogues forwarded on application.

Ulyate Orpington Poultry Farm, BERLIN, CAPE COLONY. Eggs from pure Black, White, Buff Orpingtons, Minorcas, Leghorns. Cock, Hen, and Poultry Remedies for sale. For further particulars write now for catalogue. Winners of hundreds of prizes.

T. H. Thomas, P.O. GRANGE SIDING, C.A., Amateur Breeder and Exhibitor of White Wyandottes and Buff Orpingtons. Eggs for setting after 1st. Oct., from Prize Birds and splendid layers, at 15s. per dozen; 9 to hatch or second setting at half-price.

BUFF ORPINGTONS.

THE FARMER'S FOWL. The fowl that LAYS WHEN EGGS ARE TOP PRICE and are also A 1 table birds.

My fuffs have unlimited orchard and grass run, and are noted for hardiness and good laying qualities. Young stock always for sale at very reasonable prices. Ask for inclusive quotations; carriage paid to any station in South Africa and AT MY RISK to rail destination. My list of prizes won at shows all over South Africa will convince you that this unrivalled Colonial strain of 9 years' standing CAN HOLD ITS OWN AGAINST IMPORTED STOCK. Buy hardy Colonial-bred birds and save your pocket. Eggs from pure-bred utility strain, 12/6. Address: A. C. BULLER, Dwarsriviershoek, Stellenbosch.

TURKEYS.

MANMOTH AMERICAN BRONZE. - HARDY STRAIN OF GREAT SIZE. Noted prize winners. Young stock for sale after April. Orders booked now. Ask for inclusive quotations. Carriage paid to any station in South Africa and AT MY RISK to rail destination. Eggs in season. Full particulars from A. C. BULLER, Dwarsriviershoek, Stellenbosch.

BLACK ORPINGTONS.

H. Chas. Starke, DURBANVILLE, CAPE has the leading strain of this variety. Grand table birds, excellent layers. Eggs supplied only from finest specimens, 21s. per thirteen, guaranteed fertile. A few stock birds only left for sale.

THE Agricultural Journal

OF THE CAPE OF GOOD HOPE.

No. 5.

NOVEBER 1st, 1906.

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All communications should be addressed :

“The Editor, Agricultural Journal, Department of Agriculture, Capetown.”

Telegraphic Address : “Bulletin,” Capetown.

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NOTES.

The Free List.

We again remind our readers that all farmers desirous of continuing on the free list of the *Agricultural Journal*, and those not on the list now, but desirous of getting there, must file their applications with the Resident Magistrate of the district in which they reside before the 15th of November. In order to meet, as far as possible, the wishes of all parties, Secretaries of Agricultural Societies, Farmers, Fruit-Growers' and kindred Associations can file the lists of their members in the same way. By getting the lists in districts it is hoped to avoid some confusion.

African Coast Fever.

The outbreak of African Coast Fever in Natal has given rise to some perturbation among the cattle farmers in our Eastern Coastal Districts, but as the Government is keenly alive to the imperative necessity of taking every possible measure to guard against the introduction of this disease there is no real cause as yet for alarm. Among the precautionary measure taken we may mention that 135 Native Guards have been enrolled to patrol the borders of the Bizana, Mount Ayliff and Umzinkulu districts in addition to an increased number of the C.M.R. who are also guarding the border of the Mount Currie District for the purpose of preventing any contravention of proclamation No. 312 of the 8th ult. In addition to the foregoing the existing Griqualand East-Natal Border fence is being placed in a thorough state of repair, while the fencing of the unfenced portion of the Pondoland Border from Boshoff's Drift to the mouth of the Umtamvuna River will also be proceeded with as rapidly as possible.

The Egg Laying Competition.

In another part of this issue will be found particulars of the egg laying competition now proceeding at the Western Province Agricultural Society's Grounds at Rosebank. These are given up to the 24th ult., the latest we could get for the present issue. During the month Mr. F. T. Hobbs wrote suggesting that it would be interesting to have a report of the treatment and food supplied to the birds. Upon application to Mr. A. A. Perse, the Secretary of the Western Province Agricultural Society, the following particulars were supplied: "The fowls are fed as follows:—Morning meal: mash—1 oz. per hen. A light feed of grain about 11 a.m. Cabbage and other green food at 1 p.m. Evening meal: grain—2 oz. per hen. Freshly cut green bone is given three times

a week at the rate of $\frac{1}{2}$ oz. per bird. Grit, oyster-shell and charcoal are always available in the runs, and each pen has access to a grass run every second day. The composition of the mash is as follows :—Bran (colonial) 20 parts, Pollard 20 parts, Pea Meal 10 parts, Biscuit Meal 15 parts, Clover Mixture 20 parts, Crissel (Spratt's) 15 parts. Grains are used in the following proportions :—Wheat (Colonial) 3 parts, Oats (short white) 3 parts, Buckwheat, Kafir Corn 1 part.

Mr. F. E. Frost's Imported Ram.

Herewith we reproduce a photograph of the Widgiewa Stud Ram mentioned last month as having been imported for Mr. F. E. Frost, of Essex, near Queenstown. The fleece when the ram was shorn weighed upwards of 34lbs.



Jackals in Griqualand East.

On re-reading an article on South African Jackals in the *Agricultural Journal* (writes Mr. J. Ward of Hillside, New Amalfi, Griqualand East,) I notice that the writer only mentions two species as being found in Griqualand East. Specimens of all the four kinds of jackal mentioned in this article have been killed on the farms Coningath and Kopje Alleen, within the last four or five years, in the following proportions : Two red jackals, one large

female manhaar jackal with two cubs, eight draai-jackals, and one bakoor jackal. The draai-jackal (*vulpis chama*) is known to the local natives as "M'pèma." It appears to have usually four young ones at a time though six have been seen in one burrow or hole. All the evidence points to this jackal killing sheep.

Pineapples for Export.

As the pineapple growers of the Eastern Sections are beginning to discuss the export question, the following extracts from an article on the subject by Mr. Claude Fuller, Government Entomologist, in the *Natal Agricultural Journal*, should prove of interest. Mr. Fuller went into the question while on a visit to London and came to the conclusion that there was plenty of hope provided the exporters go to work properly.

"With these thoughts in mind," he says, "I have set down the few following observations upon the packing and grading of St. Micheal pineapples, in which a large and remunerative trade is done with London by growers at St. Michael. The St. Michael pine preferred by the dealers at Covent Garden is about 4 lbs. in weight and ripens to a rich red colour. One of the most desirable features, as apart from its colour when ripe, pointed out to me was its "shape." It is a round full-bodied pine which does not taper at the "crown," but is as full and as wide there as at the base. Colour, shape, size and condition are the four requisites of a saleable pine. A consignment to be successful needs that the pines meet these requirements, and it is necessary to forward the fruit, in tip-top condition, properly graded and properly packed. There are, therefore, six cardinal points to which the exporter wishing to be successful must give his attention. The question of flavour is noticeably omitted; in fact, that seemed a minor point.

"*Condition.*—Pines when they arrive in London are still green, and they are there overhauled by the agents and coloured up in specially warmed chambers. For export from Natal—or from the pine districts of this Colony—they must be picked in such a condition that in the first place they will carry well in cold storage to London and arrive there in a suitable condition for colouring up and maturing. When picked the pine must be fully matured but still green, and it is here that there is room for experimentation. Arrangements will have to be made to ascertain just at what stage pines should be picked so that they will travel, say, three weeks and then colour up satisfactorily; this is the first essential and necessary step.

"*Colour.*—Little can be said, so far as I am concerned, upon this point. The desirable colour, to which allusion has been made, may be due to the variety or, as it has been hinted to me, to

climatic effect, soil or manner of culture. There is then some field for experimentation here, and it is necessary to ascertain if the St. Michael pine, grown under certain conditions in Natal, will on arrival in England colour up to the desired hue. Also, it is necessary to find out whether local pines will not do so as well, particularly if grown under partial shelter—that is under a slat-awning, as practised in Florida and elsewhere.

“Shape.”—The desirable shape is probably peculiar to the pine in question, but there are but few reasons against an effort being made to bring forward a local pine and by selection improve it to the desired shape. A pine of the shape indicated is undoubtedly superior to a tapering pine, as there is practically no waste of fruit whatever.

“Size.”—The size is an important consideration. A good large pine is required. Small pines are out of the question, and would not pay freight or agency fees.

“Grading.”—For pines to sell satisfactorily they must be graded. That is the contents of each package must be a uniform size. One small pine in ten spoils the box-full. When the box is opened up there should be no difference in size even to the practised eye.

“Packing.”—The whole success of any venture in the export of fruit depends upon the packing. The pines which I inspected were sent forward in packages of 10. The case is made of fairly strong white pine, one inch boards being used for the ends and half inch for sides. The cases were about 36 x 18 x 9 inches, with a partition in the middle. The pines were packed in sets of threes and twos. Rather long stalks are left on the pines, and these rest upon partitions. These partitions are brought above half the height of the box and scalloped to accommodate five stalks or they are the full depth and perforated with five holes. The material used for packing is shredded mealie husks. For this purpose only the clean inner part of the husk is used, and it has been found to answer admirably for the purpose. It is springy but firm, holds the pines well and above all looks well.”

Mealies as Food—Fancy Dishes.

Mr. J. M. Orpen writes :—I enclose a letter I received from Mr. G. Odum, of the Rhodesia Agricultural Department, on the subject of the preparation of different sorts of food from maize in the United States of America at the present day, as well as the old methods of the North American Indians. You will see there a

variety of dishes made from maize in America which are quite unknown in South Africa. I think it would be well to make these known through the *Agricultural Journal*, both for the benefit of the white inhabitants and, to some extent, for natives, to whom maize or mealies arrived only little more than a century ago, and whose variety of diet is too small. The matter on which I specially asked that enquiry should be made was with regard to the thoroughly Indian modes of preparing maize for food. I referred to a memo. I had published when I was Secretary for Agriculture in Rhodesia. It was as follows:—

“I was lately told by Mr. Corner, of the Rhodesia Railways, that in Mexico and the parts of the United States near Mexico, an old Indian custom is still followed, both by Indians and whites, of preparing Indian ‘corn’ (maize or mealies) for food by first soaking it in lye water (made by mixing wood ashes with a quantity of water and straining it), and leaving the corn in that lye till it is quite soft, so that it can be ground into a mash or paste on a hollowed grinding stone, somewhat like that used by Kafirs, by rolling or crushing with another stone. These stones are both of them somewhat different from those used by South African natives. The lower or hollowed stone is called a *Metaté*. It is of an oval shape, and the hollow in it is also oval. It is thicker at one end than the other in order to give it slope when lying on the ground. The better sort of *Metaté* is placed on three short legs of wood. Two of these are let into it below at one end and one at the other. The stone held in the hand to grind with on this hollowed stone is rounded at one end like a pestle, and is otherwise shaped like a cylindrical roller. It is held upright with both hands when being used to grind the softened corn into a paste. This paste is afterwards rolled or patted into bannocks (cookies or dampers) and roasted or baked. The lye water is of course a solution of potash, the salt which wood ashes produces. They use this lye water also to slightly soak maize, so that it can be stamped in a ‘stamp block’ to get rid of the husk, and this, it is said, makes the meal, produced from the husked grains after they are dried, well tasted. Maizena is prepared from ground maize, and is treated in course of manufacture with potash to take away its wild taste. Maizena is not yet manufactured in South Africa.” Mr. Odum’s memorandum give further details greatly improving on my rough note.

Mr. Odum’s memorandum is as follows:—“In the States we have the ordinary stamped mealies, made as they are in Africa, and often called ‘hominy,’ but as a rule hominy is made by one of the following methods: Five pounds of shelled maize, five quarts of water, and three tablespoons of potash, boiled until the hulls come off, which will be in about half an hour. The hulls are then washed out with water, and the hulled maize is placed in cold

water and brought to a boil; the water is changed three times, and brought to boiling point each time—this is to remove the potash. In the fourth water some salt is added, and the maize is cooked until tender. Cooking is usually done by placing one dish inside of another pot of water to prevent any burning.

“*With Ashes.*—A gallon of strong lye made from wood ashes is used for ten pounds of maize. The two are boiled together for half or three-quarters of an hour, or until the skin will come off. The lye is then poured off, and the maize washed with several waters, after which it is covered with water and left standing until the following day. It is again washed until the water is clear, and then boiled, the water being changed three times in the process. When soft two tablespoons of salt are added to the water. The water is then drained off, and although the maize is soft, it will keep for some time, particularly if in a cool place.

“*Frying Hominy.* Cold boiled hominy is fried in butter and served hot.

“*Baked hominy.*—1 cup cold hominy, 2 cups sweet milk 1 tablespoon melted butter, 1 teaspoon sugar, 1 saltspoon salt, 2 eggs beaten separately. Stir well together in a pudding dish until well brown. Serve hot with meat.

“*Hominy Croquettes.*—1 cup cold hominy broken up, 1 tablespoon butter, $\frac{1}{2}$ cup fresh milk. Work these together until quite smooth and a soft paste, place the dish in another of hot water and heat but do not boil, then carefully add 1 teaspoon sugar, 2 yolks eggs well beaten. Stir while they thicken, and when cold and stiff flour your hands and form in oval balls, dip in the beaten white of two eggs to which you have added 1 tablespoon cold water, 1 tablespoon olive oil if liked, 1 saltspoon salt. Then roll in fine biscuit crumbs and fry in boiling fat.

“*Hominy Muffins.*—2 cups cold fine hominy, 3 cups sour milk, $\frac{1}{4}$ cup melted butter, 3 eggs beaten, 2 teaspoons salt, 2 tablespoons sugar, $1\frac{1}{2}$ cups flour, 1 teaspoon soda. Beat fine and mix in the usual order. Bake quickly in gem tins and serve hot.

“*Hominy Waffles.*—1 cup sweet milk, 1 cup fine hominy, $\frac{1}{2}$ teaspoon salt, 2 beaten eggs, 1 tablespoon butter, 1 teaspoon baking powder. Add flour enough to make thin batter. Bake in hot well-greased waffle iron.

“*Hominy Fritters.*—1 pint cold hominy, fine, $\frac{1}{2}$ cup cream, 2 tablespoons corn starch or maizena, 2 eggs well beaten, 1 tablespoon baking powder, 1 saltspoon salt. Mix to smooth stiff batter, drop into hot fat and fry brown.

“Hominy Turnover.”—1 pint cold hominy, 1 cup cream or rich milk, 1 teaspoon salt, 1 teaspoon sugar, 2 well-beaten eggs. Work together until thoroughly mixed. Turn into a frying pan in which butter has been melted and stir until quite hot, let stand until a golden brown, fold like an omelet, and serve on a hot platter.

“The use of ash lye in the preparation of hominy is an old Indian way, but the dishes are of course ‘civilised.’ The Indians had parched corn called ‘kungwisitung’ by the Cherokees and ‘onnouguitzerleh’ by the Mohawks. The Connecticut Indians called parched corn pounded ‘ycokheag,’ and parched corn made into hominy ‘roucheage.’ The Delaware Indians called popped corn ‘psindamocan.’ The Aztecs called parched corn ground and ready to make into dough ‘pinole.’ The pop corns belong to *Zea everta*, and when quickly heated they explode and turn inside out, starch grain swelling at the same time, and the whole kernel becoming large, white, and tender. The Indians harvest some of their maize just before it ripens, cut the grains from the cob and dry it in the sun. This is stored for winter use. The corn cake of to-day, which has been elaborated by the addition of eggs and milk into the corn pones (a corruption of the Indian word ‘paunc’) were Indian dishes.

“Hoe Cake.”—1 quart maize meal sifted and 1 teaspoon salt, stirred up with boiling water into a stiff batter. Is formed into oval cakes, placed on a hardwood plank and baked before an open fire, being turned in the operation. Is split open, buttered, and served while hot.

“Johnny Cake.”—The old hoe cake has been developed into the Johnny cake. 3 cups corn or maize meal, 1 cup flour, 2 cups sweet milk, 1 teacup sour cream, 1 egg, 1 spoon soda, 1 spoon salt. Make into a shallow loaf and bake. Is often turned into a bake tin like cake batter and baked. ‘There are many variations of these dishes, which I hope to publish later.’”

FARM AND VELD.

The Possibilities of Sugar Beet.

A correspondent in the South Eastern Coastal Districts asks as to the prospects of the Sugar Beet Industry in this Colony. The Agricultural Assistant replied as follows:—The idea of growing our own sugar is a very attractive one and certainly where the essential conditions of success are present deserves earnest consideration. Briefly these are as follows:—A moderately deep loamy soil, soft ground free from stones and not over steep in view of the constant cultivation necessary are the first considerations. Secondly ample rainfall is a *sine qua non* as it is more than doubtful whether this crop would pay under conditions requiring irrigation. In the third place an abundance of manure is necessary. Kraal or stable manure as well as artificial fertiliser. Where this is all required for the vineyards, potatoes, onions and so on, there is certainly no chance for sugar beets. Further, manual labour for hoeing and singling the crop and for pulling and topping the roots must be obtainable at the particular periods when these operations are required.

Operatives for the sugar factories must also be available for the few weeks of night and day labour of the so called "sugar campaign". Incidentally of course transport for the bulky and weighty crop as well as coal at reasonable prices are material considerations.

Where these conditions obtain it would be well, before embarking upon this culture to ascertain that the beet can readily be grown over a considerable area round some convenient centre as this is essentially a crop which to pay must be annually grown on a large scale—several thousand tons—otherwise a factory cannot be successfully run.

Kilns for Chicory Drying.

Mr. G. R. Van Rooyen, of Alexandria, writes asking for particulars as to which kind of kiln would be best for drying chicory roots and if it would be advisable to first let the roots dry a little before cutting up for the kiln.

This was referred to the Agricultural Assistant, Dr. E. A. Nobbs, who states:—A Chicory Kiln should, on account of the danger of conflagration be constructed as a building apart from others and should be of brick throughout. It consists primarily of a furnace, the flues of which pass round a chamber for drying the roots in. This is entered from an outside stair and consists of a landing or antechamber and the drying room proper which is provided with stout doors. The entire floor of this chamber, which is about 8 feet above the fire grates, and is built of steel sheets with numerous perforations to allow a draught of hot air to pass through, but too small to allow the little pieces of chicory to fall through, is covered with a large grid or screen set a foot or more above the floor. The chicory dries first on the grid in a layer 4 to 8 inches deep being turned from time to time and then passes through a trap on to the floor for final drying while a fresh charge is put in above.

The intricacies and art of producing a nice white crisp dry chicory can only be acquired with experience. Unless transport is a great difficulty it would seem better to send the fresh (sweated) roots direct to an existing factory. The roots have to be washed before being cut up either by hand or by machines such as are used for cutting up prickly pear or aloes or mangold and turnip for ostriches and stock. For home use the Kiln dried white chicory has to be roasted, with the addition of a little fat to a rich brown colour then ground fine after which it may be mixed with coffee.

Practical Stock Feeding Experiment.

Mr. G. B. Dugmore, M.L.A., writes from Indwe:—Now that a good deal of attention is being given to the artificial feeding of stock, possibly the following may be of interest to our stock farmers. Messrs. Jan & Gert Van Rooyen, very successful stock farmers Windhoek, Waschbank, District of Wodehouse, tell me that they have for several years adopted the practice of sowing their lands with mealies in November. When "skoffeling" them for the second time say in January—and February—they first sow the ground with turnip seed—which is covered in with the skoffeling. Being the rainy season the turnips grow freely and by the time the mealies are harvested are getting to fair size. The stock are then turned in for a time every day, the old mealie stalks and the green turnip tops affording excellent feeding. By the time these have been eaten the roots have attained fair size, and are eaten to the last vestige by the stock—who have no difficulty in scratching them out of the ground with their hoofs.

Thus two or three months feeding is obtained during the worst part of the year—June to August. Their ewes are in

grand condition for lambing in the spring—and the gentlemen mentioned are able to sell 100 to 1,000 head of surplus stock every year as the result of an expenditure of a few pounds in turnip seed. They are also spared the necessity of trekking in search of green grass for their ewes—about to lamb. I write in hope that their good example may be followed by others.

The Storing of Fruit

Mr. Philip Brown of Molteno writes :—“ As the growing of fruit in the Colony is being so largely advocated at the present time ; I think you would be conferring a great boon on growers, if you could give them any advice and information as to the best methods of storing and keeping Apples and Pears during the winter months, so as to enable growers to be in a position to put good fruit on the markets during the months of August and September, and possibly October, when they would get the best possible returns for their outlay. I take it that the two principal rules to keep in view are :—1st. A low and as uniform a temperature as possible, 2nd. A dry atmosphere.

“ Do you consider an ordinary fruit room as generally adopted in the old country and where the fruit is stored on batten shelves erected on the south side of a dense plantation in a position where the sun does not reach it and the temperature *not above* 46° would answer the requirements. I purpose excavating the ground to a depth of 5 feet and building 6 feet above ground level, build the walls and floor of brick ; and cement same. Shelving 3 feet 6 inches wide to be arranged around the building ; with 5 feet shelving down the centre allowing two alley ways 3 feet 6 inch. wide each. Ventilation to consist of 3 inch earthenware pipes to be carried down the outside of the walls and pass through same on a level with the floor, with ventilator in roof. This would give a thorough circulation of air and prevent dampness. Any information you can give on this important subject I am sure will be welcomed by a good many. We do not want a refrigerating plant in these parts, where we often get 20° to 26° of frost. I think you will agree with me that this is cold enough to preserve anything. Frosts generally nine months out of the twelve.”

One of the first and most important essentials has been overlooked by our correspondent and that is the necessity of first establishing keeping varieties. With these a great deal can be done in the way of storing as is done in other countries. To fully answer the questions raised we cannot do better than quote Mr. L. H. Bailey, one of the recognised authorities. In his valuable little work “ The Horticulturist's Rule Book,” he gives the following information with reference to the storing of apples and pears :—

“Apples.—1. Keep the fruit as cool as possible *without freezing*. Select only normal fruit, and place it upon trays in a *moist but well ventilated cellar*. If it is desired to keep the fruit particularly nice, allow no fruits to touch each other upon the trays, and the individual fruits may be wrapped in tissue paper. For market purposes, pack tightly in barrels after the apples have shrunk and store the barrels in a very cool place.

“2. Some solid apples, like Spitzenburgh and Newtown Pippin, are not injured by hard freezing, if they are allowed to remain frozen until wanted and are then thawed out very gradually.

“3. Many apples, particularly russets and other firm varieties, keep well when buried after the manner of pitting potatoes. Sometimes, however, they taste of the earth. This may be prevented by setting a ridge-pole over the pile of apples in forked sticks, and making a roof of boards in such a manner that there will be an air-space over the fruit. Then cover the boards with straw and earth. Apples seldom keep well after removal from a pit in spring.

“4. Apples may be kept by burying in chaff. Spread chaff buckwheat-chaff is good—on the barn floor, pile on the apples and cover them with chaff and fine broken or chopped straw 2 feet thick, exercising care to fill the interstices.

“Pears.—Pears should be picked several days or a couple of weeks before they are ripe, and then placed in a dry and well-ventilated room, like a chamber. Make very shallow piles, or, better, place on trays. They will then ripen up well. The fruits are picked when full grown but not ripe, and when the stem separates readily from the fruit-spur if the pear is lifted up. All pears are better for being prematurely picked in this way. Winter pears are stored in the same manner as Winter apples.”

The Rearing of Ducklings.

“Duck,” writing from Mafeking, asks for a few hints on the rearing of Ducklings, as they generally die with him when a few days old. He asks what would be the best diet and how old should they be before being allowed to go into the water.

Ducklings require heat for a much shorter period than chickens; during ordinary weather a week to ten days is quite sufficient, but when the weather is severe they may be retained in heated brooders for a few days longer. They are frequently raised without any heat at all in mild seasons, being simply kept in small boxes,

wherein their own body heat is sufficient, but it is wise to be on the safe side.

After they are three weeks old they can bear a considerable amount of exposure. They should always have an abundance of fresh air. Many "duckers" in the old country keep them in houses built like pigsties, with an open yard in front. Another method is to enclose plots of ground about eight to the acre, with wire-netting a foot in height. In each run is placed a small house, which may be of the simplest character. Packing cases answer excellently for the purpose with a little alteration, the lid forming the door, and a few holes being made for ventilation, additional cases being provided as the inmates require increased accommodation. But during the later part of the period of growth such protection can be dispensed with, and they may be allowed to remain in the open day and night. In such conditions it is sometimes necessary during the prevalence of high winds or driving rain to hang sacking over the netting as a measure of shelter. In America more elaborate provision is made, in that long ranges of shedding are provided, divided inside into compartments by boards a foot high, and having small runs outside formed by wire-netting.

Water not required for ducklings for fattening.—The absence of what is their natural element does not decrease the productiveness of ducks, but it is found that ducklings bred from birds kept entirely on the land are less vigorous, do not grow nearly so fast, and are more subject to disease. Stock birds, therefore, should be allowed access to water after they are a fortnight old. But so far as young birds for the table are concerned they grow more rapidly if they are denied water except for drinking purposes. The great majority of English ducklings marketed during the spring and early summer have never been in water, though sometimes "duckers" allow the young birds a bath a day or two before they are killed.

Feeding.—In feeding ducklings, as great a variety of food as possible should be supplied. Barley meal, cheap oatmeal, boiled rice, each with about one-fourth of fine sharps, will afford change of diet. But with these should be mixed cooked lean meat or tallow greaves, unless a plentiful supply of worms is obtainable. In the duck districts of England, tallow greaves are largely employed, but in many places carcasses of animals can be obtained. If the ducklings are to be reared for stock birds, the food recommended is continued until they are fully matured. Mealie Meal is often used on account of its low price, but it is deficient in albuminous elements, and must be largely fortified in that direction.

Fattening.—Where the ducklings are to be killed at an early age, the system referred to above is only continued for five weeks, when it is changed with the object of filling up the frame. The final stage of preparing ducklings for market is one of very rapid development. By this time they have grown very considerably. The food which yields the best results is rice properly cooked and mixed with about one-fourth its bulk of tallow greaves or meat. At this period more fatty material is essential to soften the flesh. Barley meal, buckwheat meal, and mealie meal are often used instead of the rice, but they do not yield the same result. In preparing the rice, of which that from Burma is the best, and when in the rough, one gallon of the rice should be added to four gallons of water and about 4 lb. of the greaves or meat. This mixture is gently simmered until the rice has absorbed all the water, when it is soft, yet not a mush. In order to aid digestion the birds should have a plentiful supply of coarse grit or fine gravel, without which much of the food will be lost and the ducklings will not fatten, the cost of production being thus greatly enhanced. Green food is also valuable, and any garden stuff is good for the purpose. The birds should be fed three times a day, the object being to encourage eating, so that quick growth may be secured. Upon rice given as recommended ducklings are produced in England weighing from 4 to 5½ lb. at eight to nine weeks old.

Some Points of a Good Hog.

Professor W. J. Kennedy, of the Iowa State College of Agriculture, says the following are some of the points a good hog should possess: *Form, Legs and Feet.*—The legs should be short, straight, strong and squarely placed under the body. The pasterns must be short, straight, strong and the hog should stand well up on his toes. Many hogs are “knock-kneed,” that is, the knees come too close together. This is very objectionable in any class of hogs, but more especially in young animals, as it gets worse with age. Too much stress cannot be laid upon the set and strength of the legs.

Chest.—This is a point which the butcher pays little or no attention to, but it is of vital importance to the breeder. Width and depth of chest give stamina and constitution to the hog. The floor of the chest should be wide and close to the ground. There should be no falling away in the lower part, giving a “tucked in” appearance in the fore flank. A full and pendant hind flank is an indication of readiness for market.

Hips.—The hips should be wide apart, low and smoothly covered with flesh.

Rump.—The rump should be long, smooth and carrying width well back to tail head. There should be but very little depression or falling off from the hip joints to the tail head. Most hogs are inclined to drop off some, but straightness in this region is desirable. In the eyes of many people a drooping rump in a hog is not considered to be objectionable. This must be due to the fact that they are more accustomed to seeing hogs of that formation than those straight or nearly so. More width of rump is found where the animal approaches straightness than is usually found in the animal possessing drooping quarters. The length of quarter to a certain extent seems to be governed by the same rule. Another very common objection, in fact one of the most serious faults to be found in the hog, is crooked hind legs and sprawly pasterns. The careful observer of animal form will soon notice that crooked hocks are nearly always associated with drooping rumps. Seldom, if ever, is the crooked hock found in the animal possessing a straight rump. Recognizing these points, is it not advisable for us to pay more attention to the breeding of hogs with straight rumps?

Pamphlets on Poultry Keeping.

Messrs. R. Wilson, Son & Co., Hout Street Cape Town have forwarded a copy of Thorley's Pamphlet on Poultry Keeping. They state they will be pleased to send copies to any who would like them.

AGRICULTURAL SHOW DATES, 1907.

Paarl, on Thursday, January 24.

Stellenbosch on Thursday, January 31.

Bredasdorp, on Thursday, February 7.

Aliwal North, on Tuesday and Wednesday, February 12 and 13.

Malmesbury and Piquetberg, at Malmesbury, on Wednesday, February 13.

Robertson and Montagu, at Robertson, on Wednesday February 13.

Caledon, on Thursday, February 14.

Bayville, on Friday, February 15.

Western Province, at Rosebank on Tuesday, Wednesday, and Thursday, February 19, 20, and 21.

King William's Town, on Thursday, February 28 and Friday, March 1.

East London, on Thursday, Friday, and Saturday, March 7, 8, and 9.

Barkly East, on Wednesday and Thursday, March 13 and 14.

Humansdorp, on Wednesday, March 20.

Molteno, on Tuesday, March 19.

Bloemfontein, on Tuesday, Wednesday, and Thursday, March 19, 20 and 21.

Oudtshoorn, on Wednesday, Thursday, and Friday, March 20, 21, and 22.

Umtata, on Thursday and Friday, March 21 and 22.

Midland Agricultural Society (Graaff-Reinet), on Tuesday and Wednesday, March 26 and 27.

Albert Agricultural Society, at Barghersdorp, on Wednesday and Thursday, March 27 and 28.

Bathurst, sometime in March, no date fixed yet.

Craddock, on Tuesday and Wednesday, April 2 and 3.

Albany Agricultural Society, at Grahamstown, on Thursday and Friday, April 4 and 5.

Port Elizabeth, on Wednesday, Thursday, and Friday, April 10, 11, and 12.

Eliot, on Wednesday, April 10.

FLUE CURING TOBACCO AT BALFOUR, C.C.

Report upon Experiments in April, 1906.

By Dr. E. A. NOBBS, Agricultural Assistant.

At the present moment the average tobacco of the Cape Colony possesses an unenviable reputation for rankness and strength and for an absence of the virtues of flavour, aroma and colour which are the great desiderata of the manufacturer. One merit as a rule they do possess that of burning well and this is a property not always found in otherwise good leaf from other tobacco-growing countries. Moreover, there is a peculiar character about South African Tobaccos in which they all seem to resemble one another more than they do foreign sorts and which is absent in other tobaccos. To this distinctiveness is to be attributed that fondness for Boer Tobacco which is always acknowledged to be what for lack of a better term is called an acquired taste.

In this subtle property there rests a latent commercial possibility, exploited to-day in the general popularity of Magaliesberg and other Transvaal tobaccos.

It seems then that we can develop in the Cape Tobacco a peculiar and valued type not procurable except from South Africa.

Further, from the submission of many samples from all parts of the Colony to the final court of appeal, the manufacturer and the leaf buyer, it may be confidently affirmed that whether good, bad or indifferent, the tobacco was declared by competent authorities in the great majority of cases to be readily capable of very material improvement by means which if not perhaps at present within the reach of all yet which might without any great difficulty be brought within the grasp of everyone.

These methods of improvement of our leaf may briefly be grouped into changes of practice as regards:—

- (1) Seed and varieties grown,
- (2) Methods of cultivation and treatment,
- (3) Use of manures and fertilisers,
- (4) Curing and preparation for market.

Experiments in each of these directions have been in progress for some time at the experiment stations and on private farms. Great stress is laid upon the need of better seed and greater care in the selection of varieties to grow. Sorts considered more particularly suitable to our conditions, have been procured by the Department of Agriculture from Europe and America, Cuba and Algeria and are now being grown experimentally by upwards of two hundred farmers in the Colony.

Changes in the mode of culture it is more difficult to introduce. This is best done by precept and demonstration which is slow work and difficult to carry out effectively, but experiments in this direction are also in progress as also in the use of different manures.

Much of our tobacco is well enough grown, but in the curing much good material is wasted while the utmost profit obtainable is not realised. Very much attention has been paid to this question in the United States and we may profit by their experience and the knowledge gained there.

No doubt under our very different conditions, especially of climate, the procedure of America will not serve, unmodified, our needs, but by adopting these principles and altering them as experiment indicates it has been shewn that we can, from the ordinary tobacco now being grown under the Katberg, produce with very little labour and trouble and in very much less time than by the customary processes, tobacco worth double and more than double the usual prices.

The striking results that were attained last season deserve the closest attention of all our tobacco growers. These are now made public so that preparations may be taken in hand by all who wish to profit during the approaching harvest from the lessons learnt.

The report has been prepared in such a form as to serve as a guide to any one wishing to cure their tobacco according to the methods recommended and should any further information be desired, enquiries may be addressed to the Department of Agriculture.

Acknowledgement must here be made to the material and kind assistance afforded by the United Tobacco Cos. (South) Limited, which not only throughout the investigations gave every assistance and encouragement but which indeed rendered the experiments at all possible and through its staff carried the experiments to a successful issue.

Thanks are also due to Mr. Alfred Green of Balfour who placed the necessary land and leaf at the disposal of Mr. Henderson of the above-named company who actually carried out the work.

The accompanying correspondence, as clearly stating the scope of the experiments and the results achieved, is published, by permission.

EXTRACT.

The United Tobacco Companies (South) Limited,
Kloof Street, Cape Town,
5th July, 1909.

DR. ERIC A. NOBBS,
Agricultural Assistant,
Department of Agriculture,
Cape Town.

DEAR DR. NOBBS,

I beg to enclose a copy of a letter dated Rustenburg, 2nd July, from Mr. Henderson regarding the experiments he conducted at Balfour, and we can thoroughly endorse all he says especially where he states that the flue-cured is better and sweeter than the same tobacco air-cured. Of course we must bear in mind that when these experiments were first undertaken we were not very hopeful of getting a very satisfactory result from the seeds as at present grown, but we shall undoubtedly get very much better results from the imported seed if they will use it this season.

It will appear to us that tobacco grown from imported seed and flue-cured will undoubtedly produce a tobacco of a market value of from 50 to 150 per cent. higher than that grown and cured by the methods now in vogue, and that also with a great deal of certainty which is absent at present, that is to say, by flue-curing the growers are certain to get by far a better value for their crop, as the bright tobacco commands a much higher price than the dark red air-cured. The percentage of light leaf in an air-cured crop is a very uncertain quantity, and is not nearly so sweet as the flue-cured.

(Sgd.) J. ARTHUR PALETHORPE,
Director,
The United Tobacco Companies (South) Ltd.
Department of Manufacture.

COPY.

P.O. Box 68, Rustenburg,
2nd July, 1906.

The Directors,
The United Tobacco Cos. (South) Ltd.
Kloof Street, Cape Town.

DEAR SIRs,

The experiments which I made in the Government Flue-Curing Barn at Balfour, Cape Colony, during the months of April and May were, as far as I could conduct them, very satisfactory,

and I am glad to state that the growers of Tobacco in that district have taken a great interest in the demonstrations I made.

It has proved that the Tobacco when flue-cured is better and sweeter, and has brighter colour than when air-cured.

However, I wish to state that it was rather difficult to cure a barn full of tobacco with a uniform colour, owing to the different varieties of seed used in that district.

I made experiments with tobacco grown on two farms. One was more satisfactory than the other, and I attributed this to the tobacco being grown on a sandy soil and without much manure. Most of the tobacco seen growing was on sandy soil, and when cured in the barn, produced far better colour than tobacco grown on dark heavy soil.

I am much pleased with the results, and if growers of Tobacco will stop using the seed they have been replanting for the last ten years, and put in a new variety of imported Virginia Seed, and continue to take the same interest in the cultivation of tobacco as they were doing when I left, I believe the result will be, that they will get better tobacco than they have ever produced from that district, and they may look forward for a great future, if the flue-curing process continues throughout that district, and as the growers gain experience in that method of curing. It is however, necessary that the growers pay more attention to the seed beds, than they have hitherto done. The old way of sowing must give way to newer methods. Seed should be used much more sparingly—one ounce of really good seed is ample for 100 square yards of seed bed, giving the young plants a chance of a healthy growth, instead of being crowded together without proper space to develop. When planted so closely they grow up into tall thin weedy plants that are too weak to transplant properly, instead of being close-jointed compact plants full of life and vigour. The beds must be carefully covered with limbo or butter cloth to keep out the moths, and if this practice becomes general, the Wilt trouble will disappear.

After the tobacco is cured, much greater care is required in the grading of the crop—each class should be packed to itself by the grower, who will then reap the full market price for each grade. The Leaf should be packed in good keeping condition, so that it will not sweat and damage subsequently,

To educate the growers up to this point, will take time and perseverance, but the ultimate gain to the Colony will justify considerable expenditure by the Agricultural Department to that end.

Yours faithfully,
(Sgd.) FRANK H. HENDERSON.

REPORT OF EXPERIMENTS UPON FLUE CURING OF
TOBACCO AT BALFOUR C. C., CONDUCTED IN 1906.

THE BUILDINGS.

The first essential for the successful application of this method of treating Tobacco is the provision of a suitable building for the purpose. It is seldom that a suitable building will be found, which can be adapted for the purpose, but, occasionally, this may be the case. In the experiments under report structures of corrugated iron were used, and, although some good bright leaf was obtained in them, it is recommended that, in future, all barns should be built of burned brick, as this will greatly facilitate the work of regulating the temperature upon which the whole success of the process entirely depends. The accompanying illustration is, therefore, an indication of the form and size of barn necessary, but shews the wrong material.

In the United States, where timber is plentiful these barns are made of pine logs, but in Cape Colony burnt brick will, without doubt, form the most suitable material.

THE FLUE-CURING BARN.

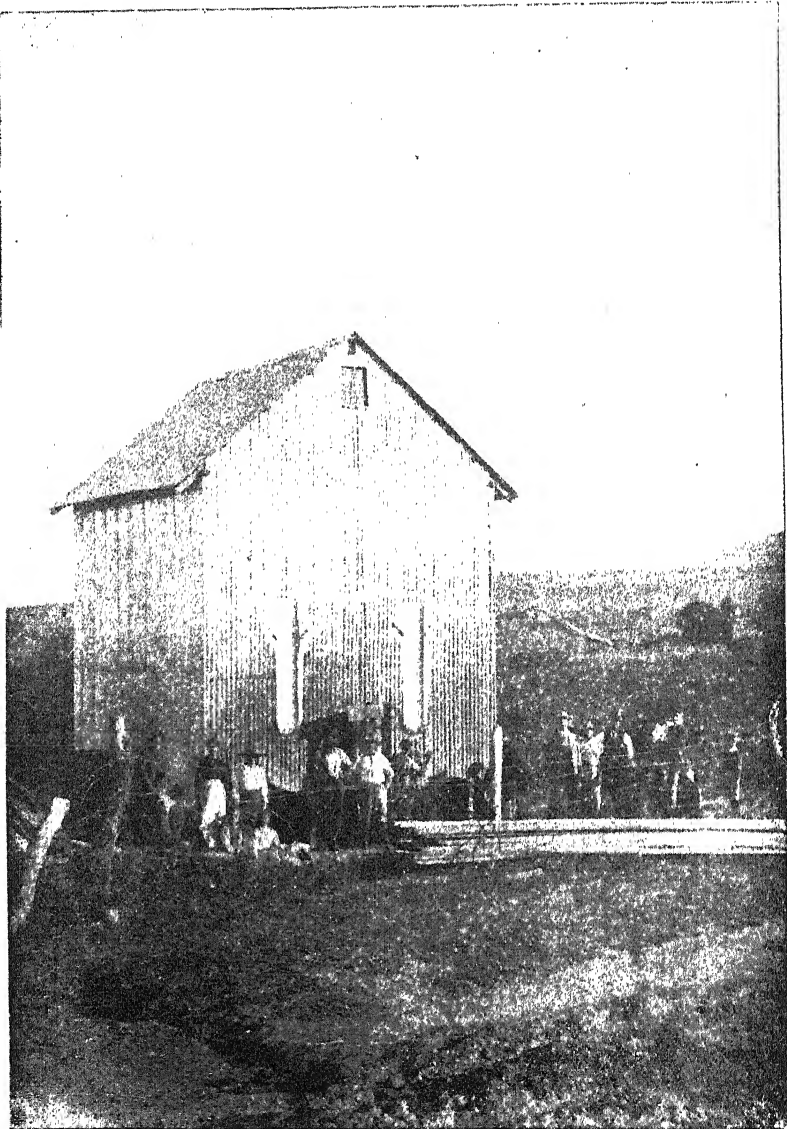
The following is the description of a flue curing barn suitable for this Colony.

Barns are made 20 feet square, and in height, 20 feet to the eaves or on a smaller scale 16 feet square and 16 feet high. Throughout the building precautions must be taken to prevent the escape of heat, all openings must be carefully fitted and no crevices left for air to enter or escape. At the highest point in the Gable there are ventilators, which may be opened or closed at will, and at one end a door is provided. At each side of the door, are two arched brick furnaces, which pass into the interior of the barn, and from which the flues pass through the building twice, emerging above the furnace mouth and carried up in a short chimney, as shewn in the illustration and plans herewith.

The foundations may be either concrete, brick or stone, and the walls must be fairly stout (13 inches) as, when the barn is filled with Tobacco there is a considerable strain upon them. The first 10 feet should be a brick and a half thick, thereafter the walls may be run up one brick thick, and should be set in lime mortar.

The furnaces project 18 inches outwards and extend $4\frac{1}{2}$ feet internally, and may be adapted to burn wood. In their construction blue hard bricks should be used by preference, though good ordinary burnt bricks will do if better are unobtainable. A 20 feet barn will require about 28,350 bricks, a 16 foot one, about 22,400 with an additional 1,800 bricks in each case for furnaces.

The roof is best made, as shewn in the drawings, of galvanised iron lined with ceiling boards, but a thatch roof covered with



EXPERIMENTAL FLUE CURING BARN FOR TOBACCO ON THE FARM OF MR. A. T.
GREEN, BALFOUR, STOCKENSTROOM.

galvanised iron on the top will also serve the purpose. Twenty-eight ten-foot and twenty-eight nine-foot sheets of iron will be necessary with five six-foot lengths of ridging eighteen inch girth; gutterings are not required. For the flues of a sixteen foot barn ten inch No. 18 gauge Russian iron stove piping with crimped ends is the best and thirty-five running feet with bends as shewn will be necessary. For a twenty foot barn the flues should be similar but twelve inches in diameter; forty-two and a half running feet with bends as shewn will be required and if the first four feet are of No. 12 gauge they will last longer and not burn out. Such piping is procurable from any hardware merchant.

The ventilator consists of a simple deal shutter swung on a pivot at the centre, so that it may be closed or opened from the outside by means of ropes. The door must be made particularly well so as not to warp and to remain air tight. It is a framed door four feet wide and six feet six inches high filled in on the one side with one inch vertical boarding and on the other with the same stuff laid diagonally. It is fitted in two halves like a stable door with the lower half to open independently of the upper half, which upper portion is only opened when filling or emptying the barn. The door frame is 3 inches x $4\frac{1}{2}$ inches stuff and is raised upon a step six inches from the ground.

The internal wood work for the roof consists of six $4\frac{1}{2}$ inch x 3 inch rafters 18 feet long; two $4\frac{1}{2}$ inch x 3 inch rafters 4 feet 6 inches long; three $4\frac{1}{2}$ inch x 3 inch collars 13 feet 6 inches long; two hundred and eighty feet run of 3 inch x 3 inch stuff to form purlins; six $4\frac{1}{2}$ inch x $1\frac{1}{2}$ inch struts 3 feet 3 inches long and eighty-eight feet run of $4\frac{1}{2}$ inch x 3 inch stuff to form wall plates. The whole must be properly halved and spiked at angles and joints and the wall plates should be secured with hoop iron built into the brickwork.

The internal space is divided into *tiers* three feet six inches apart vertically and four feet centre to centre formed with twenty-four 6 inch x 3 inch rails, 20 foot 9 inches long, built into the brickwork at ends giving five so called rooms. The whole interior of the building is thus divided by rails into five rooms of which two consist of four tiers and three of five tiers the uppermost tiers being contained within the roof.

Upon these rails the tobacco leaf fastened to light sticks, as described later on, may be hung, closely together yet surrounded on all sides by free air. These rods are 4 feet 6 inches long so as just to be supported by the frames and cross pieces by their ends. A supply of string and a thermometer complete the equipment.

QUANTITIES FOR A TWENTY FEET BARN.

28,350 bricks with an additional 1,800 for furnaces.

6, $4\frac{1}{2}$ inch x 3 inch rafters, 18 feet long.

2, $4\frac{1}{2}$ inch x 3 inch rafters, 4 feet 6 inches long.

3, $4\frac{1}{2}$ inch x 3 inch collars, 13 feet 6 inches long.
 280 feet run of 3 inch x 3 inch stuff to form purlins.
 88 feet run of $4\frac{1}{2}$ inch x 3 inch stuff to form wall plates.
 6, $4\frac{1}{2}$ inch x $1\frac{1}{2}$ inch struts, 3 feet 3 inches long.
 28 sheets 10 feet long of corrugated iron.
 28 sheets 9 feet long of corrugated iron.
 5, 6 feet lengths of ridging 18 inches girth.
 38 running feet of Russian stove piping for flues 10 inches diameter, No. 18 gauge with bends.

QUANTITIES FOR A SIXTEEN FEET BARN.

22,400 bricks with an additional 1,800 for furnaces.
 4, $4\frac{1}{2}$ inch x 3 inch rafters, 15 feet 6 inches long.
 2, $4\frac{1}{2}$ inch x 3 inch collars, 10 feet long.
 233 feet run of 3 inch x 3 inch stuff to form purlins.
 70 feet run of $4\frac{1}{2}$ inch x 3 inch stuff to form wall plates.
 24 sheets, 9 feet long corrugated iron.
 24 sheets, 8 feet long of corrugated iron.
 4, 6 feet lengths of ridging, 18 inches girth.
 35 feet running feet of Russian stove piping for flues with bends, 10 inches diameter, No. 18 gauge.
 4 running feet of Russian stove piping for flues 12 inches diameter, No. 12 gauge.

THE TOBACCO LEAF.

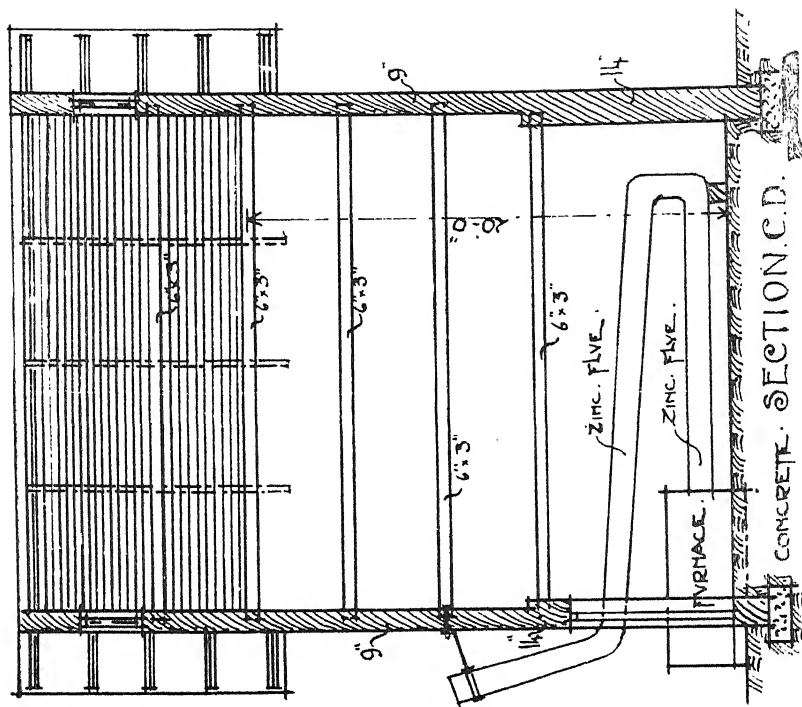
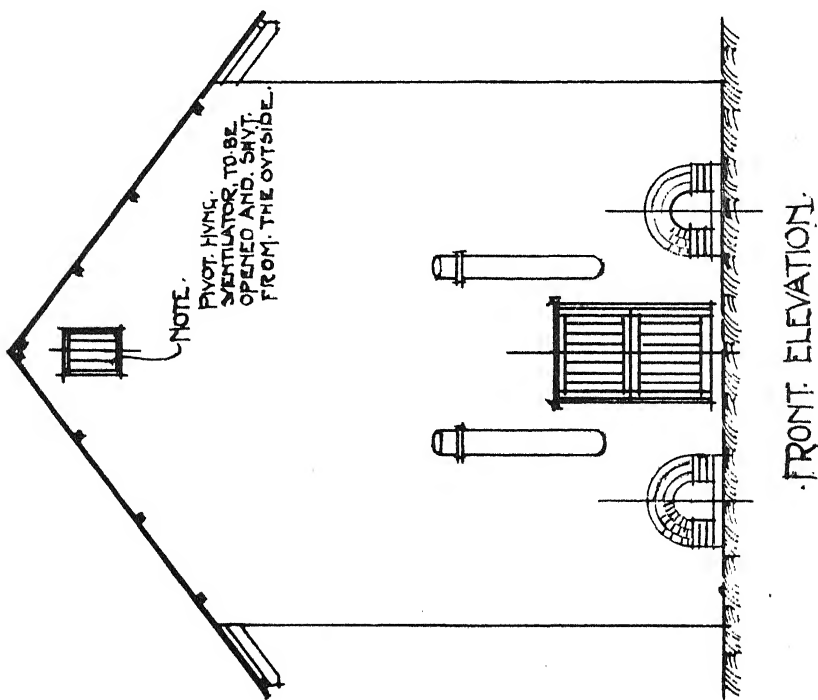
Advisability of Topping.—It is distinctly advisable to top the plants, and to do this as soon as indications of the bud appear, nipping the bud out with the thumb and forefinger.

Suckering.—After topping, suckers (savers) will appear, and must be nipped out in the same manner as a bud. Only allow one stalk to remain to each plant.

Indications of Ripeness.—The leaf is ripe for curing when, in the middle of the day, the lamina on being bent cracks across. A mottled appearance of leaf is always an indication of ripeness, but if any doubt is felt, it is better to err on the side of over-ripeness than to cut green.

When the tobacco field is ripe, start cutting in the following manner, which is the simplest and easiest way to harvest.

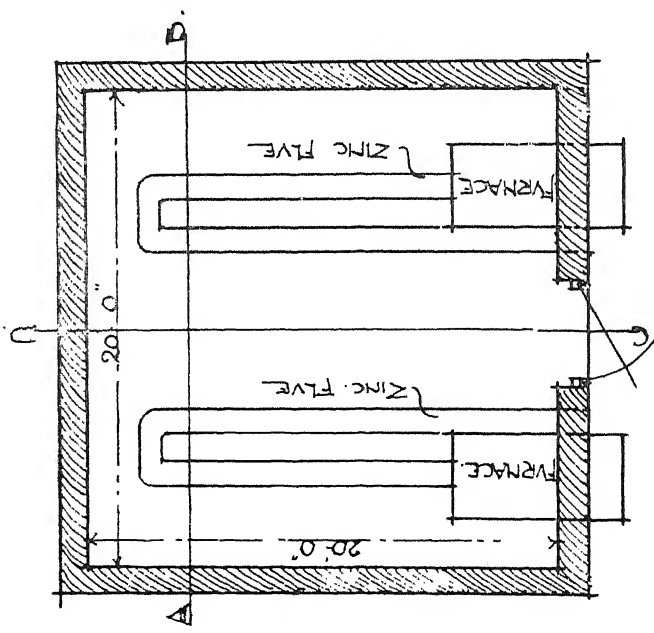
Each cutter carries a thin butcher's knife with a large handle, wrapped well with soft cloth, to protect the hand from blisters. Start together two cutters and one stick holder, each cutter taking one row and the stick holder walking between them. The cutter takes hold of the plant with his left hand at the top, and with the knife in his right hand, splits the stalk down the centre (carefully guiding the knife so as not to sever the leaves) to within three or four inches of the point where he intends to cut the stalk



PLANS OF TOBACCO CURING BARN.

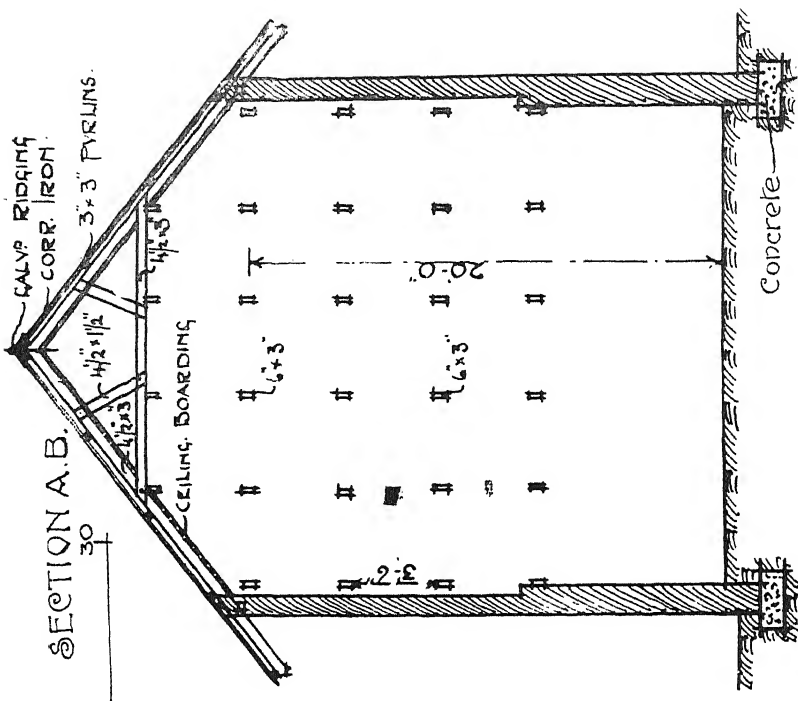
GROUND PLAN.

0 1 2 3 4 5 6 7 8 9 10



SECTION A.B.

20 30



PLANS OF TOBACCO CURING BARN.

from the root, and, as the knife descends, his left hand follows the slit or opening. Then the stalk is severed, and by a movement of the left hand, the plant is straddled across the stick, which is held by the stick holder. The plants are thus hung with the tops downwards. When the stick has received from six to eight plants, according to the size of the plants, it is ready for the barn; to which it should go at once, if the barn is near. If some distance away the stick should go to a waggon which should be brought into the lands.

While the ordinary colonial leaf found growing in the Stockenstroem division is greatly improved by flue curing, there can be no doubt, but that the superior Virginia varieties of seed, now being distributed by the Agricultural Department will give a much better result and yield, after curing, a much superior leaf, and a greater proportion of the finest colours, which, naturally, command the highest prices in the market.

FILLING THE BARN.

The rods or sticks, each with its load of pendant leaves, are carried two at a time into the flue curing barn. Here, by means of ladders, they are suspended by resting the ends on the wooden frames round the wall, and on the transverse spars. In hanging the barn, start filling the top tier and continue downwards until all tiers are filled. The sticks should be spaced about eight inches apart. Try and have the tails of the tobacco on the upper tier fall in between the sticks on the lower tier, and not directly above. When once started the barn must be filled as quickly as possible and curing commenced at once. It must not be partly filled and left over night, and then the rest filled in the morning, as this will not give a uniform colour, and cannot be treated in the same way. In a twenty-foot barn as described the roof will hold one tier of three rooms while the body of the building will contain four tiers of five-rooms. A barn will, thus filled, give from 500 to 600 lbs. of cured leaf at a time, and as the curing process takes from five to six days, it is easy to calculate how much leaf can pass through one barn in a season.

THE CURING PROCESS.

The Principles Involved.—The principle of flue curing is to start a slight fermentation in the leaf by means of a gentle heat, until it yellows, then to dry the sap by raising the temperature higher, which, at the same time, fixes the colour.

The cutting should start about 10 o'clock, after the dews are all dried off, and should not take place within twenty-four hours after a rain.

The barn will take about 3,200 to 3,500 plants, and should be filled rapidly. This work will occupy, ordinarily, from three to four hours; the door is then tightly closed, the upper ventilators are closed, and fire is made in the furnaces. Good dry wood is the best fuel to start the furnaces, and a good supply must be on hand, as no interruption of heating must take place. One large buck load of wood is sufficient for a curing. After the fires are once well started, green thorn wood is the best to use. Billets should be cut four or five feet long to fit the furnaces easily.

The Temperature.—Generally speaking, we advise that the temperature be kept at about 85° F. (not allowing it to fall below 80° F. or exceed 90° F.) for about 18 hours, after which time, if the leaf has not commenced to colour, a few buckets of water should be thrown on the floor to furnish moisture to assist in starting the colouring process. On the other hand, should you find the colouring too rapid and moisture appearing on the leaf, open the ventilators, and allow this to escape. Inside of 36 to 48 hours, the leaves should have assumed a bright lemon colour, and, when this is attained, the doors and ventilators are opened wide to allow all moisture to pass out of the barn. This will take from an hour to an hour and a half. Then, after closing the door and ventilators, the temperature is raised gradually to 100° F. at which point it should be held five or six hours; then raise it two degrees every hour until 110° F. is reached, at which point it is held for three hours; then gradually to 125° F. at the rate of three to five degrees per hour. At this stage it can be observed that the Leaf is dry, but the middle rib or stem is still full of sap or moisture. If this stage has not been arrived at, the temperature should be maintained at 125° F. until it is obtained. Then the door and ventilators should be opened and the moisture allowed to pass off in the same manner as mentioned earlier. Then close tight again, and raise the temperature 5° F. per hour up to 140° F. By this time the middle rib should be thoroughly dry, and the next process is curing the stalk itself. To effect this the temperature can be raised from 5° to 7° F. per hour up to 175° F. but on no account must the heat ever exceed 180° F. This temperature is held until the stalk is thoroughly dry, which takes from 6 to 8 hours. When this is effected the door and ventilators are opened, the fires drawn, and the barn allowed to cool down.

In this method of curing there are three principal points to be carefully watched, The first is when the Leaf is yellowing. If, during this process, it is observed that moisture is gathering on the surface of the leaves in drops, it is evident that the steaming is too rapid, and the door and ventilators should be opened to allow this moisture to pass off. If this is not done, the Leaf will cure spongy in texture and with red blotches and be deteriorated in value.

The second point is, after colour has been obtained, that the heat *must not be raised too rapidly*; as, if this is done the yellow colour will turn to a red. Be careful and give a regular heat and not permit the temperature to run up and down.

The third point is the danger of scorching or burning the tobacco by excessive heat in the final stage. Never, under any circumstances go over 180° F.

REMOVAL OF TOBACCO.

After the furnaces are quite cool (and it is best to leave the door and ventilators open over night to effect this) the tobacco can be taken down by steaming, which appears to be necessary in this Colony, where the atmosphere is so dry. In this method the doors and ventilators are closed, and a jet of steam is injected into the barn from a small boiler, until the leaf is supple enough to take down and strip without breaking. With a 10 to 15 H.P. portable boiler this can be done in about half an hour, but it will take longer with the usual boiler such as is used on farms for preparing lime and sulphur dip, etc.

As soon as the tobacco can be taken down, the leaf should be stripped from the stalk and graded into about four grades, the best coloured lemon leaves should be kept to themselves, the orange in another grade, the dark and brown in a third, and the broken common and green leaves in the fourth. Green leaves must be carefully culled out of the first three grades. About 18 to 20 leaves should be tied into a bundle or "hand," using one of the same grade leaves to tie with. Under no circumstances should grass or twine be used. If in proper keeping condition that is to say the leaf flexible not brittle, and elastic when gripped and the stem fairly dry the grades should be packed down in a stack made on planks, allowing a space between the floor and the tobacco for air to circulate. After being in the stack for 10 days, the grades can be packed into bales, each grade to itself, of about 250 lbs. and marked light, red, dark and common respectively, but, if left in the bulk a longer time it will improve and be more valuable.

RESULT OF THE EXPERIMENTS.

The processes above detailed have been successfully applied to tobacco in this Colony, indeed the above summary of the process includes several modifications of the American method to suit our conditions, as a result of practical experience gained in conducting these experiments. Of the great superiority of leaf cured in this manner, there can be no doubt, and the demand for such leaf is virtually unlimited.

As a practical outcome of the experiment private flue curing barns have been erected in Stockenstroom, and there can be little

doubt but that the methods above detailed will be largely adopted, especially as the financial benefit comes to be realised. Of course, in a process such as this there is much which cannot be learned from a written description, and time and experience can alone teach the subtle art of curing the leaf to perfection, but it is hoped that, from the directions given above, enough has been said to warrant growers in other parts of the Colony adopting and practising the method.

(Signed) FRANK H. HENDERSON.

Manager, Leaf Department,
United Tobacco Cos. (South) Ltd.

ERIC A. NOBBS.

Agricultural Assistant to the Government.

THE LOCUST INVASION.

Terms of Government Aid.

The Arsenic Remedy.

By C. P. LOUNSBURY, Government Entomologist.

By the time these notes are in press, voetgangers of the Brown Locust will probably have made their appearance here and there in all but one or two of the districts favoured by good rains in the great tract of country lying between Calvinia Division on the west, and the Transkei on the east, and north of the Divisions of Prince Albert, Willowmore, Uitenhage, and Albany. Altogether the pest is not expected to prove any worse in the Colony than last year; and, as then, its greatest abundance is expected in the divisions along the Orange River and in those adjoining these on the south.

The word "invasion" in the heading may be misapplied. The Brown Locust has bred in the Colony more or less every year since 1890, and there is no information by which to decide whether the supply of the pest is kept up by new swarms from the Kalahari desert or chiefly by swarms bred within the Cape boundaries. The systematic collection and tabulation of data that will eventually

throw light on this important phase of the locust problem was started last February, and from information received in the intervening months it appears that most of the locusts now to be found south of the Orange River are the descendants of swarms which hatched south of the River last year. This means that there would now be few locusts in the Colony proper if all of last year's swarms had been destroyed as *voetgangers* or before they had laid eggs. The Orange River Colony and the Transvaal, however, have suffered a fresh invasion from the west. The Transvaal is said to have been free of the Brown Locust in January and February of this year. In March and April, tremendous swarms entered over the Cape and Bechuanaland borders, and spread over a large part of the country in a few weeks. Whether these swarms were bred in the Kalahari or not is held to be a debatable question by the Transvaal authorities. They think that most of them may have migrated earlier in the season from settled parts of the Cape Colony and the Orange River Colony into or towards the desert, and then to have moved rapidly east and north-east on the approach of winter.

The Transvaal Government expects to spend several thousand pounds fighting the plague this season. Locust officers are being appointed in the affected areas to distribute supplies and to instruct farmers in the use of remedies, and under their guidance (though without legislation) a vigorous and systematic campaign of *voetganger* destruction will be waged. The Orange River Colony Government also, has appointed locust officers and prepared for an organised campaign. Besides encouraging the destruction of the pest by spraying, it will pay a bonus for bagged locusts; the rate has been fixed at one shilling a grain bag for winged locusts and two shillings a grain bag for *voetgangers*. An officer will tour around after the season is over and pay the bonuses with the least trouble possible for the farmer.

CAPE GOVERNMENT AID.

The Cape Government, for lack of funds, is unable this year to put special locust officers in the field. But it urges that farmers and others endeavour to destroy all *voetgangers* that hatch or migrate on to their lands, and to encourage action it offers assistance on the same conditions as last year. These conditions, as defined in Government Notice 1036 of 1905, are as follows:—

Locust Boards.

1. The Resident Magistrate of the District will nominate a Locust Board, to consist of three persons for each Field-cornetcy, Municipality or Village Management Area.

2. The duty of the Board is to arrange where pumps are to be used and to receive and determine upon applications for soap, etc., and to issue orders for the same, signed by the Chairman.

Spraying Materials.

3. Government aid will be given in respect of the following articles :—

- (1) Blue Mottled Soap.
- (2) Sunlight Soap.
- (3) Other cheap Soaps.
- (4) Arsenite of Soda.
- (5) Spraying Pumps.

4. Directions for using soap spray and arsenite of soda—sugar spray are set forth in a leaflet, which can be obtained from the Locust Board.

Soaps.

5. Government will bear two-third of the costs of soaps purchased by applicants on orders signed by the Chairman of a Locust Board.

6. The cost of the soap must be the ruling market rate.

7. Storekeepers supplying soaps on orders of Locust Boards must render to the Resident Magistrate of the District their account for two-thirds of the cost, and to applicants direct their account for the remaining one-third cost. To the account rendered to the Resident Magistrate must be attached the order, which should bear the applicant's receipt for the soap.

Arsenite of Soda.

8. Arsenite of Soda will be issued by the Resident Magistrate free of charge to applicants in their own vessels in quantities of 10 lbs, on production of orders signed by the Chairman of the Locust Board. This will not, however, interfere with the discretion of the Magistrate, should he consider it necessary to issue arsenite without such an order.

Pumps.

9. The use of spraying pumps can be procured on application to the Locust Board for such period as the Board may allow.

About six hundred Government pumps for use in spraying locusts are now distributed about the country, and further supplies are on order. If a farmer who obtains a pump for destroying locusts desires to keep the same permanently, it has been decided that he may do so on payment to the Magistrate of its actual cost to the Government. Every farmer in the locust infested area should have one of these pumps in readiness.

MEASURES RECOMMENDED. ARSENIC.

The locust officers of Natal and the Transvaal in their extensive work of the last few years have depended almost entirely on the sweetened solution of arsenic as their voetganger killing agent. They find the substance by far the cheapest and most satisfactory remedy for general use.

No one means of destruction can be recommended for use under all circumstances. It is sometimes practicable to destroy the eggs, but in South Africa only measures against the voetgangers or hoppers are employed, except in so far as winged locusts are collected by natives for food. Ofttimes fire, applied in one way or another, is by far the best and cheapest means for destroying voetgangers; at other times, trampling with sheep, etc., is best; at others, the use of screens with pits or traps; and at

still others, spraying with a soap solution or an arsenical poison. The last means, spraying, is the most generally applicable measure where water is available, especially in grass country.

Soaps make the cheapest spraying solutions known for killing locusts *by contact*. The breathing organs of the insects get choked. Blue Mottled and Sunlight brands appear to be of equal value, weight for weight, and doubtless other well-made brands are quite as good. The insects must be thoroughly wetted to get satisfactory results. The younger they are the easier they are destroyed. In general it is not safe to trust to a weaker solution than one pound of soap to five gallons of water. If too much water is used, the locusts may be stupefied for an hour or two, but not destroyed. Some claim that spraying with soap in the morning is more effectual than spraying in the evening.

Arsenic acts as a stomach poison on locusts, and kills them more or less quickly according to the strength at which it is used. It must always have several hours to work. The preparation issued by the Government is arsenite of soda. This is the chemical used in large quantities for the destruction of prickly pear; and it is the basis of all the successful tick dips. In cold water it dissolves a little slowly, but in hot water it dissolves instantly, and thus a very concentrated solution may be easily made to be diluted when and where required. Many tons were used last year for locust poisoning in Natal and the Transvaal, and this measure for dealing with the pest is now preferred to all others in these Colonies. In the Transvaal a pound of sugar is used with each pound of the arsenite, and this amount of sweetening is deemed ample to attract the locusts. In Natal several times as much sugar is generally used. The poison is lightly sprayed around or over the swarms, or in front of them if they are on the move; generally it is applied in the morning or evening when they are at rest. The strength of the solution and the quantity applied is varied with the age of the locusts and other circumstances. In general, one pound of the arsenite to about ten gallons of water is used against nearly full-grown voetgangers, and one pound to twenty gallons against newly hatched ones; but where water is scarce the solution is made stronger and the spraying more lightly done. The poison is deadly to all life. The vegetation soon withers where wetted, but stock should not be permitted to graze on the sprayed spots until after a good rain; the sprayed spots can be burned over in a few days especially during hot, dry weather. The greatest danger to stock, however, is found to be the leaving about of tins or buckets containing the solution or in which it has been mixed. Whole areas of crops should not, of course, be sprayed owing to the injury that would be done to them, but it pays well in some cases to spray small proportions with the view of attracting or driving the locusts to those parts. In storing and handling the poison, its dangerous nature should never be forgotten. Some people find the solution

to cause sores on the skin : the natives employed in spraying by the Transvaal Government are given grease to rub over themselves as a measure of protection, but this precaution is not generally practised.

The advantages of the arsenical solution, over the soap solution for spraying are that the insects need not be wetted, that much less solution need be used, and that the expense of the material and the trouble of preparation are less. It has been used around homesteads and kraals and then stock and fowls purposely allowed to feed over the sprayed parts without any losses having resulted ; but needless risks should, nevertheless, be avoided. The skin should not be wetted unnecessarily, and the hands should always be washed to remove all traces of the poison before any food is handled. It has been observed that fowls which feed on poisoned locusts do not appear to suffer any ill consequences.

THE ANIMAL DISEASES ACT, 1906.

The following is the full text of the Animal Diseases Act Amendment Act, 1906, passed by the last Session of Parliament, to be brought into operation on Jan. 1st, 1907 :—

ACT TO AMEND AND EXTEND THE PROVISIONS OF ACT NO. 27,
OF 1893, ENTITLED THE “ANIMAL DISEASES ACT, 1893.”

[Assented to 16th August, 1906]

Be it enacted by the Governor of the Cape of Good Hope, with the advice and consent of the Legislative Council and House of Assembly thereof, as follows :—

1. The “Animal Diseases Act, 1893,” shall be read and construed as if the provisions of the third, fourth, fifth, sixth, seventh, eleventh, twelfth, and thirteenth sections thereof, regarding the importation, quarantine and removal of animals applied *mutatis mutandis* to articles or things which either by contact with such animals or through any other means are or have been rendered capable of carrying the infection or contagion of disease amongst animals.

2. Notwithstanding anything to the contrary contained in Part II. of the said Act, it shall be lawful for the Minister, in the event of any animal being found affected with the disease of Lung-

sickness, the diseases of Glanders and Farcy, or the disease of Tuberculosis, to perform any of the following acts, that is to say :

(a) In case of Lung-sickness :

- (1) To cause the immediate destruction of the animal or animals found infected by the Board convened under section nine of the said Act, compensation being payable to the owner of an amount equal to one-half of the value of the animal before infection, such compensation to be assessed by the said Board and in no case to exceed forty pounds sterling for any one animal.
- (2) To cause all animals which have been in contact with infected animals and are liable to be infected to be inoculated or drenched under the supervision of a Government Veterinary Surgeon or other Officer thereto specially authorised in writing by the Minister, or other competent person authorised by the Board constituted under section nine of the said Act, and to be isolated under quarantine.

(b) In the case of Glanders or Farcy :

- (1) To cause the immediate destruction of the animal or animals found by the Board convened under section nine of the said Act to be visibly infected, compensation being payable to the owner of an amount not exceeding one-third of the value of the animal before infection, such compensation to be assessed by the said Board, and in no case to exceed £25 sterling for any one animal.
- (2) To cause all animals which have been in contact with infected animals, and are liable to be infected, to be tested with *mallein* by or under the supervision of a Government Veterinary Surgeon or other Officer thereto specially authorised in writing by the Minister, and to be isolated under quarantine.
- (3) Any of the incontact animals that react to the *mallein* test must be isolated under quarantine and destroyed on developing the disease in visible form.

(c) In the case of Tuberculosis :

- (1) To cause the immediate destruction or permanent isolation under quarantine of the animal or animals found by the Board convened under section nine of said Act to be visibly infected, compensation being payable to the owner for animals so destroyed of an amount not exceeding one-fourth

of the value of the animal before infection, such compensation to be assessed by the said Board, and in no case to exceed £15 sterling for any one animal.

- (2) To cause all animals which have been in contact with infected animals, and are liable to be infected, to be tested with *tuberculin* by or under the supervision of a Government Veterinary Surgeon or other Officer thereto specially authorised in writing by the Minister, and to be isolated under quarantine.

Animals slaughtered under the provisions of this section shall be buried by or at the expense of the owner, and if not buried by the owner the expenses of the burial shall be recoverable from such owner, in any Court having jurisdiction.

3. The eleventh section of Act No. 27 of 1893 is hereby repealed and the following provisions substituted in lieu thereof:—

Whenever it shall be proved to the satisfaction of any Resident Magistrate or any Government Veterinary Surgeon that any animal within the district is affected with any infectious disease, it shall be lawful for such Magistrate or any Government Veterinary Surgeon or other Officer thereto specially authorised in writing by the Minister upon notice to the occupier of the land on which such animal is, to declare such land or any portion thereof an infected area, and to prohibit the removal of any such animal as may be named in such notice from the land so declared an infected area for such period to be prescribed by the Minister as will enable the Governor, if he thinks fit, to issue the proclamation referred to in the next succeeding section, and such notice shall be published in some newspaper circulating in the district, and a copy thereof shall be posted at the Office of the Resident Magistrate, and from and after such notice and prohibition and during such period the owner of any animal in such infected area, who shall allow any such animal to stray or be removed into any uninfected area, shall be guilty of an offence against the provisions of this Act and liable to the penalties prescribed for the contravention of the same.

4. It shall be lawful for the Governor, whenever he shall be satisfied that it is expedient to do so in order to prevent the spread of any infectious or contagious disease amongst animals, to make, by Proclamation to be published in the *Gazette*, rules and regulations for all or any of the following purposes, that is to say:—

- (a) To prohibit or regulate the movement of persons and the removal of any article or thing whatsoever into the Colony from any place beyond the Colony, in respect of which there shall have been issued any Proclamation under the provisions of section five of Act No. 27 of 1893.

- (b) To prohibit or regulate the movement of persons and the removal of any article or thing from any area within the Colony, proclaimed as infected with any contagious or infectious disease, or from place to place within such area.
- (c) For the removal, isolation, quarantine or treatment, whether by inoculation or otherwise, of any animal within the Colony, and for the disposal of any article or thing which there shall be reasonable grounds for believing capable of conveying any contagious or infectious disease.

Provided that in the case of lung-sickness, glanders and tuberculosis, no restriction shall be placed on the movement of persons.

And the Governor may, by Proclamation, provide for penalties for the contravention of any Regulation made under the provisions of this Act, which shall not exceed twenty-five pounds sterling for any one penalty, or in default of payment of such penalty to imprisonment, with or without hard labour, for a period not exceeding three months, and any person contravening any such Regulation shall be liable to a penalty not exceeding twenty-five pounds sterling, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

5. It shall be lawful for the Minister or any Officer thereto duly authorised by him in writing to enter at all reasonable times any land or premises for the purpose of carrying out all or any of the provisions of this Act.

6. It shall be lawful for the Minister or Officer thereto duly authorised by him in writing to enter upon land being private property, being a suitable place pointed out to such officer by the owner or occupier, and to take temporary possession of such land for the purpose of quarantining animals under the provisions of this Act, and stamping out any contagious or infectious disease; and, for such temporary occupation and for any loss or damage resulting therefrom, there shall be paid to the proprietor such compensation as shall be mutually agreed upon, or, failing such agreement, as shall be determined by arbitration in accordance with the "Lands and Arbitrations Clauses Act, 1882."

7. The term "animal" shall, for purposes of this Act and Act No. 27 of 1893, include such animals as are from time to time proclaimed to be animals for the purpose of the said Acts.

8. This Act may be cited for all purposes as "The Animal Diseases Act Amendment Act, 1906," and shall be read as one with the "Animal Diseases Act, 1893."

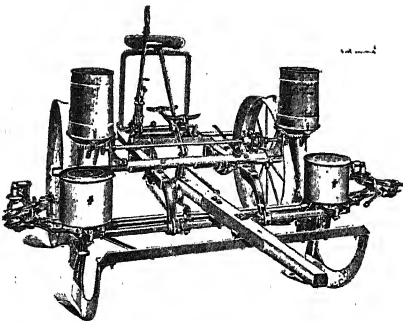
MEALIE CULTIVATION.

(CONTRIBUTED.)

Each year the great importance of the mealie crop becomes more and more apparent in many parts of this Colony, particularly in the Eastern Province, and our farmers are undoubtedly wise in paying the greatest possible attention to it, since it can be made to pay handsomely, especially when cultivated in a proper manner. And further it is planted and reaped at such seasons as to render it less liable to the risk of destruction from frost, drought or locusts than other crops. If, however, this country is ever to take its place amongst the leading mealie growing countries of the world, it is necessary that this crop should be cultivated on scientific lines, as, when the work is carried out in a haphazard manner, the result is not always satisfactory and is frequently disappointing.

The first and most important point is to have the land well ploughed and thoroughly pulverized, so that a good seed bed is prepared. It is not, however, proposed to deal with this point in the present article, but only with the methods of planting and cultivating the crop. It is a mistake to sow mealies broadcast if it can be avoided, as the plants from seed thus sown have not a fair chance to attain perfection, since proper cultivation is difficult if not impossible, and the plants are irregular and so crowded sometimes that they have not even sufficient room to develop. An efficient drill and one strong enough to stand hard work in the field should be used. With it the mealies can be planted in drills at regular intervals of, say, 2 feet 6 inches to 3 feet 6 inches apart. Different growers hold different opinions as to the best space to leave, but 3 feet 3 inches or 3 feet 6 inches is about the distance which finds general favour, and is probably the best for the average variety of

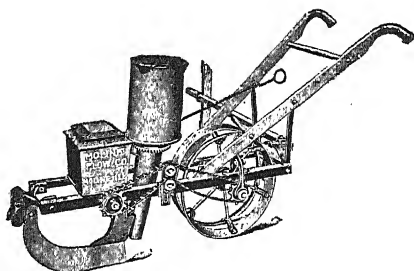
Mealie. This leaves ample room for the plants to develop, and permits of the effective use of a cultivator. There is a number of efficient single-row as well as two-row and three-row Planters imported into this country, those chiefly favoured being of the "Planter's Friend" and the "Champion" type. The "one-row" plants in a continuous row at any width, which can be easily regulated by means of a marker. The



The Two and Three-Row Type of Mealie Planter.

two and three-row will also plant in continuous rows at widths of from say 2 feet 6 inches to 3 feet 6 inches, and with all these

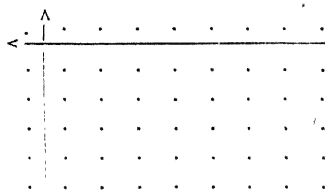
machines the kernels can be planted in the ground either deep or shallow, and the distances between the kernels in the row can easily be regulated by means of cog wheels, which either increase or decrease the size of the plates for discharging the seeds. It will thus be seen that the Mealies can be planted close together in the row, or wide apart, while at the same time the distances between the rows can also be considerably varied. The following plates are generally supplied, viz., to drop mealies singly, or to drop them in little hills, say three or four kernels at a time; also plates for Kafir corn, turnips, beet, lucerne, or any other seeds of the same description. All that is necessary is to change the size of the holes in the plate.



Single-Row Mealie Planter.

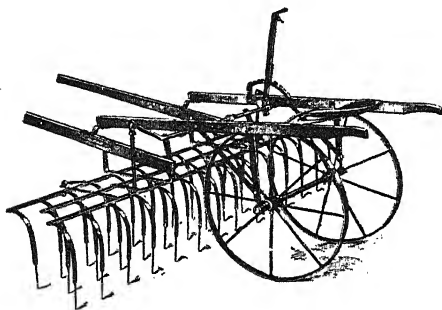
In connection with these Mealie Planters, there is also a fertilising attachment, and one of the leading importing firms in South Africa are so far up to date that they have supplied with the fertilising attachment cups for the discharge of finely-ground kraal manure. This is undoubtedly a very important addition, and it is made without extra charge, and as most farmers have tons of kraal manure lying about practically useless under ordinary circumstances, this can be utilised to great advantage, by means of this cup.

With the two-row and three-row machines can also be supplied what is known as the "Check Row Attachment," and this is used where the most advanced methods of planting mealies are pursued. The check row attachment permits of the Mealies being planted in straight rows, cross-wise as well as lengthwise (see diagram), and a Cultivator can be



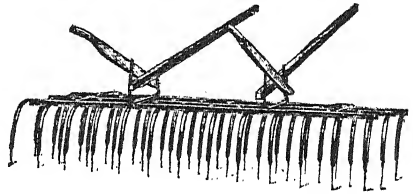
used in both directions.

Before and just after the young plants come out of the ground, a weeder should be used two or three times. The weeder is one of the most valuable implements a farmer can have, as it runs lightly over the ground, catching all the young weeds which sprout near the surface, besides breaking up the

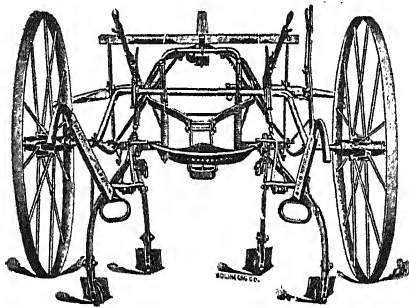


Riding Weeder for Mealie Cultivation.
surface of the soil, but it does not injure the deeper rooted mealies.

Later on, when the plants are too high to permit of a Weeder being used, they should be regularly cultivated with a horse hoe, or, better still, with a specially designed cultivator for this purpose, as shown in our illustration. This type of implement is extensively used in the mealie growing districts of the United States and other countries, and it is undoubtedly the most satisfactory that can be obtained for this class of work. It works on both sides of the row at the same time, the frame passing over the row, and it is so constructed that it can be operated amongst the plants without injuring them until they have reached such a height that the necessity for frequent cultivation is passed. A very efficient implement of this class is the "Dandy," which is capable of numerous adjustments, the shovels being so arranged that they can, in a few moments, be altered to work at different depths, and also closer to or farther from the plants. Another good feature is that the shovels can be worked quite close to the rows without the



Walking Weeder for Mealie Cultivation.



The "Dandy" Type of Horse Hoe for Mealie Cultivation.

slightest risk of injuring the plants and the axle is adjustable, so that the distance apart at which the wheels work can be regulated, and thus rows of varying widths taken.

It is reasonably certain that a farmer who will take the necessary pains to cultivate his mealies in the manner outlined above will receive an increase of yield which will repay him many times over for his trouble.

Messrs. Malcomess & Co., Ltd., of East London, kindly supplied the electrotypes used in illustrating this article.

BLACK PEACH APHIS.

At this season of the year there are always a number of complaints from Midland and Northern districts of the Colonies about the "Black Peach Aphis," an insect, allied to the well-known Green Fly of roses, that appears in extraordinary numbers on the young shoots of the peach. It crinkles and dwarfs the leaves, and is accompanied by myriads of ants, flies and other insects which come to feed on the honey-dew. Parts of Natal are troubled with the pest, and for several seasons the Natal Entomologist has recommended that infested trees be sprayed with nicotine dip as a remedy. The following letter, reprinted from the *Natal Agricultural Journal* is evidence of the value of the remedy:

"I should like to place upon record my appreciation of the suggestion given me by you with regard to the destruction of black aphis on peach trees. Following on your instructions, this is the third season that I have successfully used nicotine sheep dip for the purpose of destroying this pest, and I have always used the same—McDougall's Lion Brand. My peach orchard contains 100 peach trees, now about 10 feet high, and last year's crop amounted to over 50,000 peaches. The strength which you suggested was 1 in 100, and I find that after the dip has been open for some time it may possibly lose some of its strength, so that I have had to use it as strong as 1 in 70. I find that the most effective strength with freshly opened dip is anywhere between 1 in 70 and 1 in 80, but the secret of its success seems to lie in the fact that the spraying should be done early in the season before the buds shew any signs of breaking, and I have nearly always found that at most two sprayings are sufficient. Many trees I am certain would be kept quite clean with only one, but for safety's sake I usually give two sprayings, and in a very few cases I have had to give three sprayings to individual trees. The quantity I use amounts to less than $1\frac{1}{2}$ tins, each tin 1 gallon, diluted as above, and this amount gives a thorough spraying to the 100 trees. It is needless to say that a proper sprayer should be used, and that the work should be done thoroughly, because if half done naturally some of the aphis will escape, and they are very prolific. The only complaint I have with regard to nicotine dip is that the more we use the higher the price seems to be. Whether this is the fault of the trade or whether the price of tobacco has gone up I cannot tell you, but it should be remedied if possible.

THE RELATION OF MERIT TO PEDIGREE.

BY A SOUTH AFRICAN FARMER.

In a former article in which "The Value of Pedigree" was treated of, it was shewn that this value was dependent on the merit possessed by the ancestors recorded. By "merit" is meant great excellence in the qualities for which the breed represented is valued.

Doubtless the question arose in the minds of some readers, "why cannot a pedigree be made to guarantee not merely that each ancestor was of the same breed and character, but of outstanding excellence as well." In other words, why should not each animal before becoming eligible for a register, be subjected to some process of trial similar to a man passing an examination in some particular subjects. For horses bred for speed, there is the racecourse and the trotting track, for those bred for strength the test of drawing heavy weights. For cattle the value of their milk and carcase, and power of labour. For sheep the value of their wool and meat. The breed records of the present day are many of them getting overburdened with numbers, and breeders have for many years wondered when the limit would be reached, and have exercised their minds in trying to hit upon some satisfactory method of barring their registers to all but those animals that can be proved worthy in themselves.

This is undoubtedly an age of specialists, both in man, and animals, but it is still an open question as to whether it is the most suitable state in which to live, entailing as it does a great dependence one upon the other. The leading men of the world are those who can successfully surmount the greatest number of difficulties, not those prominent only in one direction. So it is with animals. The really first class racehorse must possess other qualities as well as speed. The most valued cattle and sheep are those which can profitably produce more than one commodity. So that great merit in one direction only has not yet come to be accepted as all-sufficient for our needs.

It is generally admitted that the passing of an examination by a man is no guarantee that he will be successful in after life. If this is so with beings whose characteristics are in a measure

open to our reading, how much greater is the difficulty with animals, whose qualities are hidden from our view. It would be simple to demand proof of the yield of milk, or wool, a cow, or sheep, could give in a specified time, and fix a standard to which all must attain, before becoming eligible for recording in a register. It would be more difficult to fix a value to which the carcass must attain for food purposes, and which could only be determined with fairness on the death of the animal, after a course of preparation. It would be practically impossible to determine the value of the animal, as regards the use made of the food consumed, the absence of ill-health, or as a breeder of progeny which would follow with faithfulness in their mother's footsteps. Therefore it will be seen that if merit is taken to mean merit in one direction only, it is possible to apply a test, but though this may be a great help as an adjunct to a breed register, yet it would not satisfy the real requirements of the breeders, and would, if slavishly followed, result in something quite different from what is generally required. No single test will prove if a man, or animal, is really great, or desirable, and single ideals will surely result in single qualities.

In this connection one of the laws of nature claims a hearing also, and these laws however we may try, we can only partially subdue. Breeders know well that even with pure-bred animals long bred for a certain purpose, and whose progeny can be relied on, up to a certain point, to conform to the general characteristics of the breed; that at intervals one is produced that varies in some degree from the character of the immediate ancestors. This is called a "sport," and is the result of "atavism" or reversion to some remote ancestor, though only called by the latter name when it is recognized as such. A "sport" being generally taken to mean, an "unaccountable occurrence." Yet we may rest assured that these so-called "sports," are merely reversions to a long-lost-sight-of ancestor. This wonderful provision of nature that ordains that a characteristic may lie dormant for many generations, and yet come to life again to confound the "Lords of Creation" who imagine they have safeguarded against it by making their own laws. Let it be understood that these variations are but slight in really pure breeds, and often hidden to the casual observer. Sometimes these "sports" are of value, and are taken advantage of by observant breeders to improve their stock in some point; oftener they are inferior, but the breeder knowing their ancestry, is content to retain them, well knowing that if suitably mated, their progeny will again conform to the previous type. This by some might be considered bad practice, as tending to a renewal of the "sport," at no distant date, but this rarely occurs if the animals are suitably mated. It is really impossible to maintain any animals in a constant and sure state of high artificial excellence. Nature is always pulling in the opposite direction, and takes immediate advantage of any carelessness in

inating and treatment, to pull a little harder. If it were not so our animals would advance in merit by leaps and bounds.

The practical side of this, is, that in a breed of animals noted for a certain characteristic, occasional ones are produced that do not shew this point in so pronounced a form. These if falling short of the standard fixed would be barred from registration, though perhaps superior to others which attain the standard. Superior, in that they will produce better progeny than the latter, some of which while passing the test, may never again produce their equals.

Some will say that by perpetually eliminating all that do not reach a certain standard, that the standard will be surely raised, and this is no doubt true up to a certain point; but don't let us forget that if rapid progress is being made in one direction, and thereby causing an abnormal excellence, that it is being made at the expense of some other characteristic which is gradually fading away. In breeding animals, the only sure way is the steady accumulation of merit in a well balanced and correlative form, and this can only be attained under the watchful eye of the breeder who knows the history of each individual. A test, as of the value of wool yielded by sheep, would be a useful guide to a breeder, but it is courting failure to oblige all sheep to conform to a fixed standard, unless that standard is a very moderate one. It would be interesting to know what progress has been made in the last hundred years, in the average productive capacity of our pure breeds, and how much of this progress is due to better treatment and feeding; and whether a similar progress has been made in fitting these animals to make the best use of their natural food, while exposed to the elements.

Another objection to making it obligatory that animals should attain a certain high standard, is the temptation to owners to force their animals by artificial means to an abnormal production during the test,—witness the dairy tests of America—resulting in the eventual loss in value of an otherwise extremely desirable strain. Some of exceptional constitution, and therefore great value, may withstand this treatment for a few generations, but there is only one end in view; certain qualities are developed at the expense of others, and nature eventually gains the day. Lack of forcing, will moreover cause an equally good animal to attain a lower standard, and give a false impression of its value. The foregoing must not be taken to mean that tests are of no value, because they are of value in many ways, but it must be left to the individual breeder to appraise that value at its own worth. In relation to pedigree they are not admissible.

To turn to another aspect. Some may say "supposing the foregoing be granted, why should it not be left in the hands of a capable judge, to decide if an animal is worthy, or not, of being registered." Now this is going from bad to worse. A test is a

guarantee that an animal is good in at any rate one quality, but the opinion of a judge, who sees the animal for perhaps the first time, is,—though of interest,—quite insufficient to take as a standard of merit for registration. Granted that there are a very few men in the world, who seem to have been born with the gift of seeing the good and bad qualities of a special variety almost at a glance; how are these men to be found, who are willing to act? The best and most competent would, owing to their knowledge of the difficulties, and responsibility, hesitate to take such a position. And supposing they did so, it would go hard with the breeders who favoured a somewhat different type to that the judge favoured. A man is but human, and being so, is bound to have his own ideas as to the relative value of certain types of a variety. Then it is well known that fashion changes in animals, as in everything else, and what might be sought after as being of most value at one time, may later be totally superseded by another type, which is then thought to be the most valuable: and even this latter, may be found to be an error, and fashion reverts again to the old type. If a pedigree register was formed on these lines, it would mean a state of uncertainty, and consequent lack of progress. This argument applies more forcibly, when one judge retires, and another, of different ideals, takes his place.

From time to time the idea is mooted, that a so called expert should act as judge in the show yards; the argument against such, being, that by this method, only animals of one type, and that favoured by the expert, would ever have a chance of winning; and the eventual outcome be a general mediocrity throughout the land. It may be said that if a scale of points were established as a standard, it would, in the hands of an expert judge, be a guarantee against favouritism of any one type. Now though a scale of points may be of some value in a showyard, as a standard for pedigree registration, they are no better than the opinion of the man who inspects. In the first place, the efficiency of a scale depends entirely on the man who handles it, he can award more, or less, as the point approximates to his own ideal; there are no actual measurements. In the second place, think of the scale that would be required for registration purposes; which would require all the hidden, as well as visible qualities, to be taken into account. There is only one man who is capable of appraising these qualities, viz: the breeder, who is in daily touch with his animals from their birth to their death. Take the case of atavism before mentioned, only the breeder who knows, can place the true value on an animal that fails to come up to his standard. How many sires and dams have there been that, though inferior in appearance themselves, have proved to be the progenitors of numbers of exceedingly valuable animals. These would be lost by a scale of points or the opinion of an expert, seeing only, and knowing nothing of the animal's history. And vice versa, how many grand animals have failed ever

to produce their equal ; these would be a doubtful gain to a register.

Where a register is being newly formed for a breed practically pure, but hitherto without a register, some control is inevitable ; but this control should take the form of inquiry into the previous history of the animals presented, rather than their individual merit. There is a tendency in the present day to form what are called "new" breeds, but which consist of cross-bred animals bred to a common type, and which continue to shew great vigour for a considerable time owing to the intermingling of alien blood. When the time arrives that these can be relied on as being really pure, this vigour will have passed away, the result of the close breeding always necessary to fix a type permanently. It is doubtful if these breeds are of any real use to the community. Rather let the effort necessary to form these be directed to the improvement of existing pure breeds of long standing, and of which there are sufficient in the world to meet every need.

The breeding of high class animals has reached the highest perfection in the British Isles, where the true Anglo-Saxon liberty of individual thought and action is preferred, to that fostering tutorism exercised by those in authority in some other countries.

Breeders as a body are men who are original in their ideas, and who are ever ready to rely on their own judgment, and quick to see the value of animals for their own purposes. And the more successful are men of pronounced character who thoroughly know their own minds. Would such men allow themselves to be told what sort of animals they were to breed, and what not to breed, by other men who may be styled "experts"? Experts are in their place when teaching the ignorant, but not so when attempting to teach their peers. If such a course were followed the result would be the stifling of all original action, and all hope of seeing the striking progress of the past repeated in the future. Proofs are plentiful. Unknown men, working quietly with their ideal before them, springing suddenly into repute and affluence when the ideal has been reached, and their fellow breeders recognise the merit of it. Would this have been, under a system of inspection by other men, perhaps condemning the animals used in the production of the ideal, because they did not find favour themselves. Let each breeder use his own unfettered judgment, and if he fails to make his mark in the world of livestock, let himself be the one to blame. Shows will provide a test of merit in certain obvious directions.

Trials may provide a test in other more hidden ways.

But a Pedigree Register must still remain, as heretofore, solely a guarantee of pure descent alone.

And as far as can be seen, the only solution of the difficulty in the compound increase in the number of entries in a Pedigree Register, lies in the good sense of breeders in entering only those that are of exceptional merit, in a general or sought after direction, and those whose progeny are likely to be worthy. Unless some system of

only allowing each breeder to enter a certain fixed number annually be adopted. Even here, as a breed becomes popular a greater number are demanded and bred, and more breeders mean a greater aggregate of entries. But this latter point can in this country be safely left for the next generation to deal with.

ESSENTIALS IN GOOD BUTTER- MAKING.

Particularly for Summer Months.

By R. SILVA JONES, Dairy Expert.

During the summer heat considerable difficulty is always experienced by dairy farmers in making a really good marketable butter, and these few points are penned to help those, who often through want of a little knowledge on the subject especially in the heat of the summer, suffer far more inconvenience than they should. Although I do not wish to infer that without means of artificial cooling, hard and firm butter can be made throughout the summer, I am certain that if these suggestions are followed, the bother and inconvenience of soft butter will be reduced to a minimum, and the quality of the article made will be most decidedly improved. In many cases the quantity will also be increased, as, under the present conditions, tests go to shew a considerable amount of waste in the method of working.

First and foremost the buildings or rooms in which the butter is made should be thoroughly well cleaned up and should be well white-washed at least once a year, preferably it ought to be done at the beginning of each butter season which, is as a rule, in December. For an ordinary farm dairy, from an economical and from a working point of view, I consider a building on the hut principal, if properly made, and nicely finished off on the inside, will answer the purpose admirably. I noticed a very nice arrangement the other day in a farm dairy on the hut principle.

The floor of half the hut was cement and the other half was boarded; the cemented half was used for the churning etc., and the boarded half for the making up and packing on. This arrangement being so much nicer for those working with the butter. The dairy itself should be exclusively used for the cream ripening

and butter making. Nothing else ought to be kept in the room not even the separator. It is much better both from the point of view of cleanliness, and also for easy working, that the separator should have an apartment quite to itself. In some cases a corner of the milking kraal is divided off for this purpose and in other cases it is done in an adjoining room, but wherever it is done, it will be found that anywhere other than in the dairy itself will be preferable, as the dairy must be kept scrupulously clean, and with the separator therein it necessitates the tramping of a large amount of dirt and dust into the dairy besides the smell of oil, and in the summer it will be found easier to keep the temperature lower on account of there being less traffic in and out.

The only objection to the separator being away from the dairy, and perhaps in the kraal, say for instance, is the accommodation for hot water for washing up on completion of the work. But this small objection is I think easily over-ruled by the consequent advantages gained.

It must be fully understood at the outset by butter makers that the quality of the butter to be made is obtained during the process of cream ripening, and it behoves everyone therefore to pay very particular attention to this process, as the churning is purely mechanical. If good cream is put into the churn there is every possibility of getting a good butter out, but if indifferent cream is put into the churn it is unlikely, in fact it is impossible for a good butter to be the result of the churning. In order to obtain this object it is essential that the cream should be taken from the separator as thick as is consistent with perfect separation. For this the milk should be separated as soon as possible after it is milked to prevent the temperature falling. During the winter months the cream can be separated a little thinner, in fact it will be found better to thin it down a little as soon as the cold weather sets in, or loss of butter may be the result from imperfect separating. One hundred pounds of cream should produce from fifty to sixty pounds of butter. One considerable error that is generally made is that the cream bucket containing cream from a previous separation is placed under the cream spout to receive cream from subsequent separations. This, especially during the summer, is a fatal mistake. No cream must be mixed until such times as the new or freshly separated cream has stood and cooled to nearly or close to the temperature of the old or previously separated cream. The reason for this is obvious. During the summer months cream often becomes over ripe, which must in turn tell against the butter produced, and the repeated addition of warm cream to the bulk helps this overripeness, whereas if it be allowed to cool first and is then added to the bulk, the tendency to this overripeness, which often develops into partial decomposition, is reduced to minimum, and the benefit of this practice will evidence itself at once.

The next, and equally as important as the previous process, is the thorough aeration of the cream itself. The benefits derived from this aeration may be summed up as follows, that is, of course, together with the occasional stirring of the cream to complete the aeration :—

The exposure of the cream to the air permits of the free passage of the naturally cow-like smell which belongs to fresh warm cream. By being exposed to the air while it is cooling down, this will pass away. The air again is responsible for bringing out the natural colour of the butter and prevent the cream from ripening unevenly and producing butters of a different character from the same bulk of cream. The continual stirring, say at least morning and evening, brings a different portion of the cream to the surface and allows the whole to ripen evenly. By this stirring should the cream not be sufficiently thick, and milk being present in the cream which must be avoided if possible, the coagulation of such milk will be broken down and the term may almost be applied that it has the tendency to liquefy such coagulation. This cream will then pass away with the buttermilk, but if it is not stirred the milk at the bottom of such receptacle holding the cream, will coagulate into a mass and deteriorate the cream and when the whole is thrown into the churn, the churning process will break the coagulated milk into small lumps which will become mixed with the butter and it is impossible to get them out. The butter will then be full of white spots which will soon start to decompose and naturally will carry the butter with it and soon become uneatable. No cream must be added to the bulk, at less than twelve hours to the churning, or streaky butter will result therefrom.

It will therefore be seen how important it is first of all not to allow any milk in the cream, and should by any mistake any milk become mixed with it, how by continual stirring its ill-effects may be reduced. The cream to ripen is best put into any vessel very open mouthed, ordinary milk dishes are best, but if the amount of cream is large, they are cumbersome. When large, buckets are best, enamelled preferably, if the enamel is not chipped. They should be immediately discarded for cream as soon as they chip. Whatever is used should only be covered over with butter cloth—no lid of any kind that excludes air should be used—and to stir the cream with, a wooden spoon will be found better than anything else. When the cream is ready for churning—*i.e.* sufficiently ripe, which can only be gauged when the cream should be distinctly acid to taste, but still retaining its sweet smell. The cream so treated will undoubtedly be found far too thick for churning. It should then be thinned down with clean fresh water—on no account should milk be used—until the cream runs easily off the stirrer. If this is not done the cream is apt to “bong” or “froth up” in the churn and make the process of churning very laborious.”

The temperature of the cream is the next important item to notice.

The temperature of churning naturally varies in accordance with the time of year, and as a general standard 60° Fahr. may be taken as the churning degree to be varied in accordance with the surrounding temperature, in winter up to as high as 62° or 64° Fahr. but in summer down to 56° or 58° Fahr., if that temperature can be got, where no artificial means are at hand to reduce it. In order to reduce the temperature in summer to as low as is possible, the cream should be placed outside the building at night, with wet bags or cloths securely tied round the outside and of course of necessity churned early in the morning. But where the cream has been properly separated and ripened it will be found that it can be churned at a little higher temperature with no ill effect to that which has been improperly ripened. It is advisable to strain the cream into the churn in order to break any lumps and secure an even churning. Great benefit in the quantity of butter will be found in churning the cream at a proper temperature, especially in the winter months, as when churning at a very low temperature without heating, a considerable portion of the butter is wasted by not being churned and passing away in the butter milk. Dairy thermometers are an essential adjunct to the dairy.

They will save you work and give you better and larger results. These thermometers are inexpensive, being only about 1s. 6d. to 2s. 6d. each, but care must be taken that correct ones are purchased, as being so cheap they are not all quite reliable. It is easy to check them against another one that is more reliable.

Colouring of butter, where it is needed, may be resorted to without ill effects, but it should only be resorted to where absolutely necessary and the market desires a butter of a higher colour. Fortunately, however, colouring is seldom needed in this Colony. When, however, it is necessary only the best should be used and used sparingly. I can recommend Chr. Hansen's Butter Colouring as being very good. It should be added to cream after it has been thinned down just prior to commencing to churn. The colouring must be diluted with water to insure its perfect mixing with the cream.

The cream is now ready for putting into the churn, having been thinned down, and temperature made correct. The most practical method of heating the cream is to place the receptacle holding it into a larger one containing warm water of not over 90° to 100° Fahr. and keep the cream well stirred until the desired temperature is arrived at. The End-over-End churns are the churns that commend themselves best for the use of the farmer, although I am partial to the Alpha churn from which I have seen excellent work. When the end-over-end churn is used it must not be filled more than two-thirds full at the most and the

churning should be slow at first until all the gas has been allowed to escape by the ventilator provided on the lid of the churn. A few turns of the churn and the ventilator should be released and repeated until no more gas is formed. The churning may now be continued without interruption, special care should be given to these ventilators, as if not occasionally taken to pieces and thoroughly cleansed, the cream collects inside and in time becomes quite green and is bound to become a detriment to the butter. A very large number of churns of this type I have seen with the ventilators in a very bad state, the owners having tried all manner of means to clean them but not knowing that they should take them to pieces, could not clean them properly. The speed of the churn must be judged by the amount of cream in it. And it should be so turned that the operator can hear the most work going on inside. On no account must the churn be driven too quickly or the cream will bong at either end of the churn and the butter consequently will not come.

Notice must now be taken of the small glass window on the lid of the churn, for as soon as the butter commences to come it will be seen on the glass in little particles. The moment this is noticed the churn should be stopped and a little brine water added, which helps very much to separate the butter from the buttermilk and at the same time will protect the butter from being unduly knocked about and made soft. Churning must now continue slowly until the grains of butter have become sufficiently large, say about pin head size. It is not advisable to churn larger than this and on no account whatever must the butter be churned into a lump, as in that state no washing can possibly remove the buttermilk, which if not thoroughly removed, will deteriorate the keeping qualities of the butter. The buttermilk is now drawn off, and the butter allowed to drain as thoroughly as possible, so as to remove all buttermilk which will then consequently take less water for washing. The washing of butter in this stage must be done with care, as although it is highly necessary to wash it, the more likelihood there is of the colour and flavour being washed out, so that the washing should be carefully carried on. Add plenty of water, replace the lid and churn slowly a couple of revolutions and let off the water at once. Try if possible to get the butter clean with two washings of strong brine, but more than three should not be used. That is why I prefer to allow the butter to drain well after the first milk has been drawn off. The advantage of washing the butter in this grain form is that every particle of butter can be separately washed and with the brine water every granule of butter comes in contact with the brine which has the tendency to harden the butter in summer time. In cold weather it is not necessary to use brine water, fresh water without salt answers the purpose equally well. Brine salting, however, does not give the butter sufficient flavour of salt for most markets and it therefore

necessary while working the butter to add a little dry salt say from $\frac{1}{4}$ to $\frac{1}{2}$ ounce of salt to every pound of butter. Care should be taken to use really good fine salt. Dry salt is also necessary to improve the keeping qualities of the butter. After having the requisite amount of salt it must be evenly sprinkled over the butter and the whole well worked, by passing the roller backwards and forwards over the table.

It must be remembered that butter can only stand a little working, and in summer time this process of working often has the tendency to make the butter soft, and if this is the case, that the butter becomes soft and the salt not sufficiently worked in, it will be found very beneficial to put that butter away for a couple of hours, or even till next morning, when it will be found that the butter will have resumed its own natural consistency and the process of working can be continued. Care must always be taken not to overwork the butter, as if it is once well overworked and made greasy, the butter will never return to its own natural firm and nutty consistency although on the other hand the salt must be well worked in or the moisture will evaporate and leave the salt to crystallise which spoils the appearance and would also cause "mottled butter."

The butter is now ready for packing for the market, an article on which will be seen in August edition of this *Journal* and it is not necessary to repeat it here, but the following short rough summary of notes may be found to contain information:—

1. Milk in as cleanly a manner as possible and protect the milk standing in the kraal by putting butter cloth over the buckets to keep out the dust and dirt.

2. Attempt should be made to improve the system of milking at present in vogue, the system of the milkers moistening their fingers in the milk is bad, and it must be remembered that the richest milk comes last and that of the poorest quality first, therefore the calf with this system in vogue is taking all the best which is the farmer's profit and oft-times detrimental to the health of the calf.

3. The use of a "Thermometer" in a dairy is essential, the "rule of thumb" working very often plays one false. A hanging wall thermometer and a floating one for working with will be of tremendous help all through the year.

4. All cows are not profitable from a dairyman's point of view, therefore it is highly advisable that a series of testing and ultimate weeding out be instituted, from a milk producing point of view. At present many cows eat up the profit made by others, reducing the profits of the herd.

5. In cleaning wooden dairy utensils use nothing but hot water. Soda is often used, but it should be discontinued as it will cause the cream to "go to sleep" in churning. After washing the wooden things don't stand them in the sun, it will crack them.

6. Cream when ripening cannot be exposed to the fresh air too much, nor can it be stirred too often.

7. Too much attention cannot be given to the temperature in dairying. Correct temperature, by use of the thermometer, is the controlling influence of milk and cream.

8. Don't work the water out of the butter on the worker first and then add the salt, add the salt at once, and work the salt in while you work the water out. By the former you either overwork the butter to get the salt in or if you don't you cannot work the salt sufficiently in.

9. Try not to wash the butter more than is absolutely necessary. The more you wash the butter the more possibility there is of washing out its taste and flavour.

10. It is far better to stand butter and cream outside during the night, properly protected from dust, etc.

11. Neat and tasty make up of the butter and neat packing will help a lot in the sale of the article on the market.

12. It is not desirable to use any "preservative" for fresh butter, if the cream is well and properly ripened; the butter should keep long enough for the fresh butter trade without it.

13. It will be better always to churn the cream a little on the under ripe side than over ripe. Over ripe cream is the forerunner of rancidity.

A NEW METHOD OF MAKING DRY RED WINE.

BY FREDERICK T. BIOLETTI.

*Reprinted from Bulletin No. 177 of the Agricultural Experiment
Station, of the California College of Agriculture.*

In the March and April issues of the *Agricultural Journal* this year (Nos. 3 and 4 of Vol. XXVIII), we reproduced Mr. Frederick T. Bioletti's work on the Manufacture of Dry Wines in Hot Countries from Bulletin No. 167 of the California Experiment Station. The following being a further contribution on the same subject, we reproduce it in the hope that it may assist the wine-makers of this Colony to overcome some of their difficulties.

In Bulletin No. 167 (of the California Experiment Station), discussing various means of improving the quality of dry wines made in hot countries, the conclusion was reached that the method which offered the best hope of attaining the end in view was that by which the requisite tannin and colour were extracted by heat before fermentation. The method, as outlined there, is as follows:

- "1. Heating the crushed grapes to a temperature and for a time sufficient to extract the necessary colour, tannin, and body.
- "2. Immediate separation of the must, and cooling to 85° F.
- "3. Immediate fermentation of the must at a temperature not exceeding 90° F."

The bulletin further states: "The present status of the method is this:

- "1. It has been shewn, both in California and in France, that it is possible, when working with small quantities, to attain the object in view by this method.

“2. The method has been used with success in France in the whole output of a cellar manufacturing 75,000 gallons of wine in a season.”

Experiments, made on a sufficiently large scale during the past vintage, have further demonstrated that the method is perfectly adapted to large-scale practice in California, and that it is possible by this means to produce a wine of excellent quality where it had been found impracticable to do so by the old methods. These experiments indicate strongly, moreover, that it is not only possible to make good dry red wine by this means, but that, where the climate is hot during the vintage, it is the simplest and most economical method of attaining the end in view when working on a large industrial scale.

This is not intended to mean that the use of this method alone is all that is necessary to improve the quality of the dry wines of our hotter regions, but that, together with proper attention to the ordinary details of wine-making, the proper use of cooling machines, and perhaps of pure yeast, we have a means by which we can be sure every year of making the best wine that the grapes available are capable of producing. In a cellar properly arranged for the purpose, all this can be accomplished at a cost so little in excess of the usual methods of manufacture that the loss which occurs in practically every large winery in the State, of a few vats of wine by bad or incomplete fermentation, far more than counter-balances it.

The experiments shew further that, where the grapes are well ripened and in fair condition, all that is necessary in our hot valleys, for the production of good, sound wine, is the use of cooling devices in the fermentation, and attention to proper sterilization of vats and casks.

In order to give a clearer idea of how the method could be carried out on a large scale in a winery built for the purpose, a plan of such a winery has been given with enough detail to exemplify all parts of the process and to enable any one to calculate the cost of operation.

While the main object of the experiments was to test the capabilities of the method referred to, other methods and other matters of interest in the fermentation of wine were investigated both for comparison and for the purpose of devising the best way of carrying out the method in practice.

The main lines of investigation were the following :

1. Extraction of colour and tannin by artificial heating.
2. Control of the temperature of fermentation by means of a cooling machine.
3. The use of pure and selected yeast.

4. The use of sulphurous acid in controlling the temperature of fermenting grapes.

5. The making of wine from incompletely ripe grapes.

In order to make the bearing of the experiments clear, a detailed account of the method used is necessary. Reference to Bulletin No. 167 will make the objects of the principal experiment clear. There will be found a discussion of the effects of high temperatures on the fermentation of wine, and an account of the preliminary laboratory experiments which led to the devising of the method used in the larger winery experiments this year.

It will be seen, from the reference given, that high temperatures have beneficial and necessary, as well as injurious, effects in the production of dry red wine, and the experiments detailed here shew that a practical method has been devised which will "combine the beneficial effects of heat in the extraction of colour, tannin, and body with those of cool fermentation in producing bouquet, freshness, and maximum amount of alcohol." These experiments also indicate very strongly that by use of the method recommended we are certain to produce a sound wine from any grapes in fair condition, however hot the season; and that, even when the grapes are inferior by reason of mould, drying up, etc., much better wine can be made than by any of the usual methods.

The principal merit of the method, therefore, is the *certainty* it gives that *every vat* of wine will be *perfectly sound every year*.

DESCRIPTION OF METHOD.

Crushing.—The grapes were taken as they came to the winery in the usual way, passed through the ordinary crusher and stemmer, and pumped by means of a must-pump through the regular must-line into 1,500-gallon vats.

As the crushed grapes came into the vat a small amount of potassium meta-bisulphite dissolved in water was added gradually, in such a way as to distribute it equally throughout the vat. The amount used varied from '2 to '4 per mil. of the weight of the grapes, that is to say, from 6 to 12 ounces per ton.

The sulphite was added to paralyze temporarily the action of the moulds, bacteria, and yeast present, and to facilitate the solution of the colour. Another important use of the sulphite is to prevent too much oxidation during the heating, and so to avoid the "rancido" taste which might be acquired if the grapes were allowed to remain hot too long or if they were too high.

Preparation of Vats.—The vats were cleaned with hot water and soda and then swabbed with a 3% solution of commercial sulphuric acid to partially disinfect them. The acid solution was

left on the walls of the vats for a few hours and then rinsed off with water.

Straining.—At the bottom of each vat was placed a strainer extending from the bung-hole across the whole bottom to the opposite side. The form of strainer used is shown in Fig. 1. It consisted of an inverted rectangular trough closed at one end and

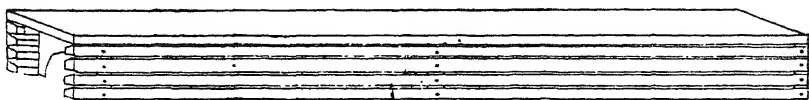


FIG. 1. Strainer for bottom of Fermenting Vat.

having a top consisting of a solid board, and sides consisting of slats made with bevelled edges like the slats of a press basket.

These strainers were found to be not sufficiently effective, owing to the very thorough way in which the grapes were broken up by the method of handling. In practice it would be necessary to have a more efficient method of straining, or to adopt a method of crushing the grapes and conveying them to the vats, which would not result in such complete maceration.

The former, *i. e.*, the use of a more efficient straining device, would be preferable, as it is very desirable to have the grape-pulp thoroughly disintegrated in order to facilitate the extraction, which takes place the more rapidly the more completely the grapes are crushed.

As soon as the vat was full of crushed grapes the must was allowed to run off the skins into another vat. It was found possible to run off a volume of must equal to only one half of the total volume of the crushed grapes. With a better arrangement for straining, a volume equal to two-thirds could be run off, which would much facilitate the subsequent operations.

Heating.—As soon as the must was separated it was passed through the heater and back into the vat containing the strained skins. The must was heated to from 140° to 150° F., and as the grapes were much cooler they remained at the bottom, and it was found very difficult to mix the two when the hot must was pumped on to the top. This difficulty was overcome in great measure by attaching the hose, bringing the must from the heater, to a faucet in the bottom of the vat. By this means the hot must was forced through the cool grapes, and a thorough stirring at the end equalized the temperature in the whole vat.

The Heater.—The must was heated by means of a “must-heater” constructed by Gomot, of Nîmes, France. This machine is essentially a large tubular pasteurizer.

The height of the boiler is 6 feet 10 inches from the ground to

the top, and the chimney is 2 feet 5 inches more. Its diameter is 4 feet 3½ inches, and the tube connections protrude a few inches more on all sides.

It consists of a system of copper tubes, through which the wine runs, and a boiler surrounding them, which is heated by a fire in the firebox below, from which the heat passes by four flues into the chimney. When used in the way intended by the manufacturer, the boiler is filled with water. In our experiments, acting on the suggestion of Mr. Meakin, we found it more convenient to simply admit steam into the boiler and to dispense with both water and fire.

There are eighty straight copper tubes joined by unions outside the boiler. These tubes are each 3 feet 10 inches long and 1½ inches in diameter, and are easily cleaned by removing the couplings, for which purpose the arrangement is very simple. In our experiments, there was no deposit whatever in the tubes, and after passing water through the machine they were found perfectly clean.

The machine is furnished with a strainer, which prevents seeds and skins passing into the tubes. This strainer must be opened and cleaned occasionally, and is so constructed that this is easily done. Four thermometers are placed in various parts of the heater, which enable the operator to control the heating perfectly. There is one thermometer in the boiler, one at the entrance of the must, one at the exit, and one half-way between these. By carefully watching these thermometers and manipulating the steam valve, the heating can be regulated in a few minutes to any degree required. The heating remains very constant so long as the steam pressure does not vary, and providing the supply of must is regular.

A handpump can not be used to supply the must, as the output is too irregular. It is necessary to have a pump that will give a constant stream of uniform volume. For this purpose a steam pump would be excellent, as its output can be regulated to any desired rate. For the experiments a gasoline motor pump especially constructed by Gomot for the purpose was used. The rate of pumping could be varied by a simple arrangement to from 375 to 1,500 gallons per hour. Such control of the rate of pumping is necessary, as the heating depends on the rate with which the must passes through the machine, as well as upon the amount and pressure of the steam admitted.

Capacity of Heater.—It was found that the machine would heat 1,000 gallons of must per hour from 75° to 150°F. when the temperature of the boiler was kept at 185°F. The steam pressure during the trials was 80 pounds. There was no pressure in the boiler of the heater, as it has an opening above.

Heating the must to 150°F. is about what would be found convenient in practice if the temperature of the crushed grapes

was 75°F. and two-thirds of their volume of must were passed through the heater at 150°F. This is just about what is necessary to give the desired results.

Extraction.—When the mass of crushed grapes has reached the desired temperature, it is left, with occasional stirrings (every three or four hours), until the required colour and tannin have been extracted by the must.

It has been shewn by the experiments detailed in Bulletin No-167 that the colour and tannin are extracted *pari passu*, so that by periodical observations of the colour it is possible to note the progress of extraction.

Salleron's Vino-Colorimeter.—For this purpose a Salleron vino-colorimeter is extremely useful.

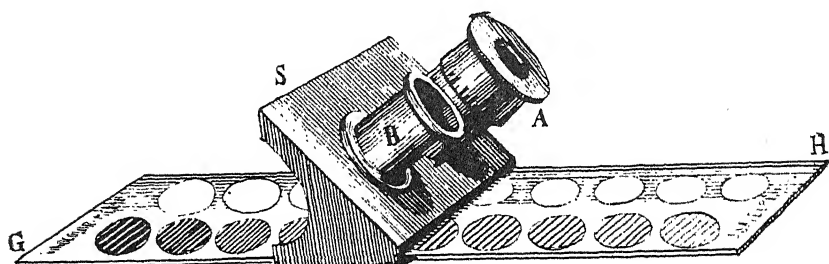


Fig 2, Salleron's Colorimeter.

So far, this is the best and most practical means which has come into general use for measuring the colour of wine, and as some quick and reliable means of determining the colour during the process of extraction is necessary for the proper carrying out of this method, a short description of the instrument is given here.

The colours of wines differ in two respects. They may differ in tint (that is to say, the kind or nature of the colour may differ), and they may differ in intensity (that is, the depth or amount of colour may differ). In order therefore to measure the colour of a wine and to compare it with the colour of another wine we must measure both its tint and its intensity. Both these measurements may be made with the Salleron vino-colorimeter.

For the determination of the tint a scale (Fig. 2, G-H) is furnished, consisting of a piece of cardboard on which are gummed small discs of silk which represents all the tints usually found in dry red wines. At the top of the scale is a disc marked VR (violet-red), which is the tint of a new wine made from a good colouring grape with full acidity, such as the Petite Sirah or Cabernet. At the bottom of the scale is a disc marked 3R (third red), which is the tint of an inferior colouring grape with low acidity, such as Grenache or

Mission. Between these extremes are eight other discs representing the intermediate tints which red wines may have. Altogether there are ten discs representing ten tints, which are marked as represented in Fig. 3. Each tint differs from the one above it in having a slightly greater admixture of yellow.

Wines of claret type should not fall below the 5VR, while those of Burgundy type may go to the bottom of the scale. Ports contain more yellow than even the 3R, and can not be measured satisfactorily by this scale. As wines become older the tint gradually becomes yellower, so that a wine which, when made, corresponds to the VR disc, may fall to the 5VR disc when it is a year old.

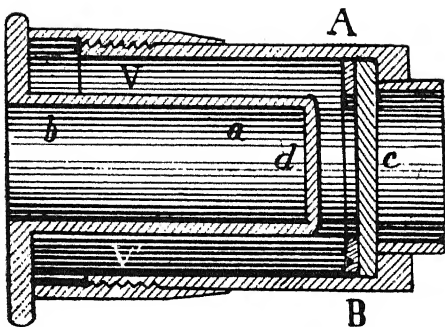
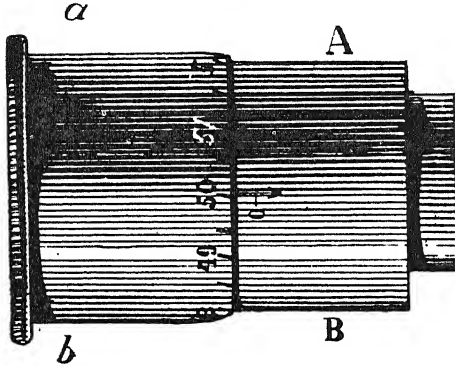


FIG. 4. Construction of Salleron's Vinocoloimeter.

which makes it possible to compare its tint, and also to measure the intensity itself.

To use the instrument a small portion of the wine is placed in the receptacle V (Fig. 4), and the screw cap *ab* moved up or down until the thickness of wine between the glass discs *c* and *d* through which we look gives us an intensity equal to that of the discs.

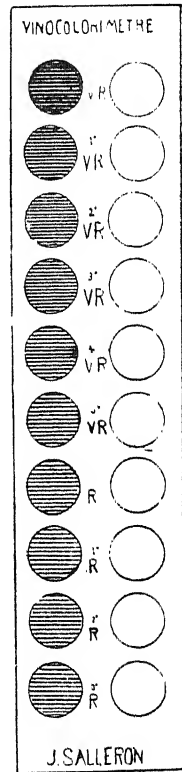


FIG. 3. Scale of Tints.

All the discs are made with the same intensity of colour, so that in order to compare wines with them it is necessary to reduce the intensity of colour of the wines to that of the discs. This is done by varying the thickness of wine through which we look. If we observe the colour of a wine by looking through it in a glass three inches in diameter, it will appear to be twice as dark or intense as if we look through it in a glass of only one and one-half inches diameter. This principle is made use of, both to bring the wine to the standard intensity

The scale is then moved back and forth until the proper tint is found.

We now have all the data for describing the exact colour of the wine. The tint is given by the name of the disc used and the intensity by the distance of d from c , which is read off from the scale on the outside of the cap ab at the point marked on AB with an arrow.

If we get such a reading as 3VR, 160, it means that the *tint* of the wine is third violet red and the *standard intensity* is obtained by looking through 160 hundreds of a millimeter of the wine. If we get the reading 80 on the scale it will show that only half as much wine is necessary to give the standard intensity and, therefore, that the wine is twice as dark or intensely coloured as in the first case. The smaller the reading on the scale, therefore, the more deeply coloured the wine.

To overcome this inconvenience, Professor Hilgard has adopted a scale of which the notation is inversely proportionate to the thickness of the wine necessary to give the standard tint, and of which, therefore, the numbers given are directly proportionate to the intensity of colour. For this purpose he has taken a wine which required 40 hundredths of a millimeter to give the standard intensity as an arbitrary standard, which he calls 100. A wine with half this amount of colour would then, with this scale, have an intensity of 50. The number is obtained by dividing 4,000 by the reading of the scale. This would give us, then, for the first example an intensity of $4,000 \div 160$, or 25, and for the second $4,000 \div 80$, or 50.

If R represents the reading of the scale, then $4,000 \div R$ Intensity by Professor Hilgard's scale.

Comparison of Scales.

Salleron Scale.	Hilgard Scale.
40	100
80	50
160	25, etc.

The Hilgard scale has the great advantage of giving a clear idea of the intensity of colour in a wine without the need of making any mental calculations, for if the colour of one wine is represented by a number three times as large as that representing the colour of another we know that the first has three times as much colour as the latter.

Professor Hilgard's notation has been used in the account of experiment work detailed later.

In the absence of any recognised standard of intensity for the colour of wines, it is difficult to say what the proper degree of colour is. In order to give some idea of what the numbers of Professor Hilgard's scale indicate in practice, it may be said that a wine measuring 15 in intensity would be considered sufficiently

dark for an ordinary table wine. Any wine which falls below 10 is too light in colour, while anything over 20 may be considered darker than is necessary. These figures have reference to the United States. In Europe the popular taste does not require quite so much colour.

A young wine should contain more colour than these figures indicate, as a certain proportion of the colour always drops during ageing. This loss of colour is most rapid during the first two months after fermentation. It becomes less rapid later, until after four months the loss is very slow. The amount of loss varies very much with different wines, and with different methods of handling, but a Zinfandel to have 15 of colour when it is two years old should have at least 35 or 40 directly after drawing off from the fermenting vat, and, to preserve its colour even so well as this, it must have full acidity and must not be aged too quickly by frequent racking or keeping in small casks or warm cellars.

The following table is appended to show the actual loss of colour found by observation. The tests were made with experiment wines fermented at the Station cellar, and were all made in small quantities and kept in casks of from 10 to 20 gallons. In larger quantities the loss of colour would be slower, and the depth of colour indicated for four months probably corresponds to what would be found in practice in a wine of the same character at the end of eighteen months or two years.

TABLE 1.
Loss of Colour during Ageing of Wine.

Number of Wines Examined	COLOUR.				
	At Pressing.	1 Month.	2 Months.	3 Months.	4 Months.
		<i>Loss.</i>	<i>Loss</i>	<i>Loss</i>	<i>Loss.</i>
Four	330	191 42.1%	117 64.5%	114 65.5%	101 69.4%
Six	140	95 32.2%	91 35.0%	68 51.4%	59 56.8%
Five	85	50 41.2%	36 57.6%	34 60.0%	27 68.2%
Seven	35	25 28.6%	16 54.3%	15 57.1%	13 62.9%
Five	23	15 34.8%	11 52.2%	10 56.5%	9 60.9%
Three	13	9 30.7%	9 50.7%	7 46.2%	5 61.5%
Average of colour remaining ..	100	65.1%	50.9%	43.9%	36.5%.
Average loss of original colour for each month	.. ..	34.9%	14.2%	7.0%	7.4%.

It will be seen by examining the table that approximately the same proportion of the colour is lost whatever the original colour.

in the wine, so that it is possible to foretell within very close limits what the colour of a wine will be at the end of a certain time when kept under certain conditions. This applies only to wines of which the colouring matter is normal. Wines made from such grapes as Lenoir, Grenache, Trousseau, or from partially dried or mouldy grapes, lose their colour more quickly.

It may be said, then, that wines kept in very small casks lose about one-third of their colour during the first month, about one-half during the first two months, and nearly two-thirds of their colour during the first four months after pressing.

The loss at first is much more rapid in the very deeply coloured wines than in those more lightly coloured, as is shewn by the curves in Fig. 5.

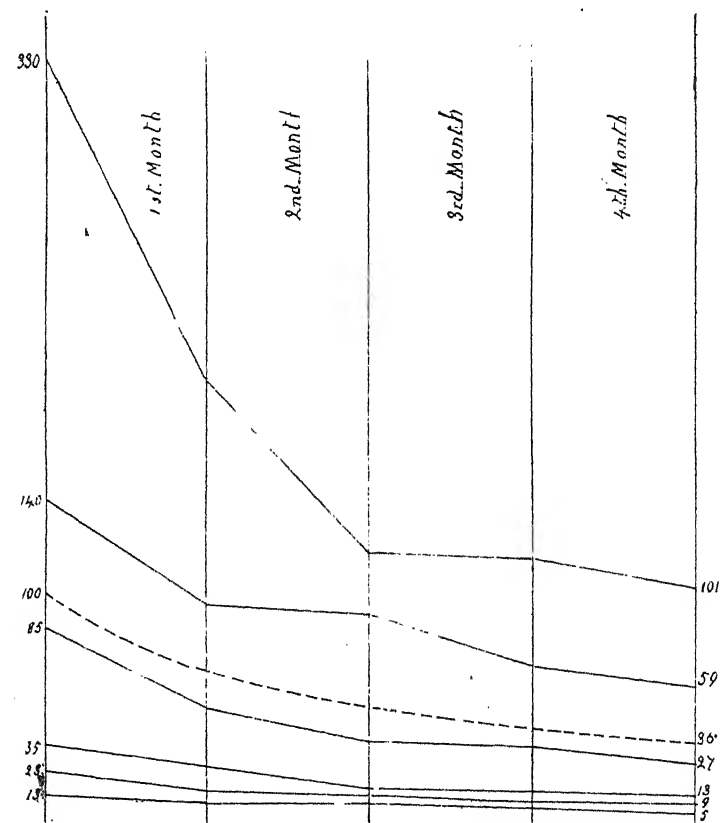


FIG. 5. Loss of Colour in Red Wines during the First Four Months.

The numbers on the right shew the colour at pressing; those on the left at four months. The dotted curve shews the average loss calculated from observations on thirty wines.

Cooling.—As soon as the extraction of the skins has proceeded far enough, as indicated by the reading of the colorimeter the must,

now containing tannin and colour, is drawn off and cooled to 80° or 85° F. The hot must runs off very freely, as the pulp cells of the grapes have all been thoroughly heated and have lost the power of retaining the juice possessed by the cells of fresh grapes. A certain amount of juice remains, however, in the skin, most of which can be recovered by pressing, as is ordinarily done with fermented grapes. It would be better to extract this juice by some diffusion process, but so far no satisfactory method of doing this has been devised. In the experiments, only the must which ran off without pressing was used, but it would be very desirable to obtain that remaining in the skins, as it contains more colour than that in the free run. A continuous press would be excellent for this purpose, as the maceration of the pomace which occurs with such presses would not have the bad effect it has when pressing fermented pomace, because the extra amount of solid matter would be to a great extent precipitated during fermentation.

As soon as the must is cooled and run into fermenting vats, any correction which it needs, such as the addition of acid or water, should be made. At the same time a starter of yeast should be used, preferably of tested pure yeast.

Pure Yeast.—In the experiments, a pure Champagne yeast was used. This yeast had been thoroughly tested and found capable of fermenting out very sweet musts and producing a good wine. The same yeast was used in all the experiments and was found to give good results with both white and red wines.

Method of Using the Pure Yeast.—A method was devised for keeping a supply of pure yeast on hand for the various fermentations, which was found very simple and convenient. As the method is of general application and could be used for the same purpose with the ordinary methods of wine-making, it is described here.

The method adopted was as follows: Starting with a 4-ounce flask, the pure yeast was increased by pouring it into a large flask containing one gallon of must which had just been cooled to 90° F. after sterilizing by boiling. Three days later, this gallon of must was fermenting well and contained a large amount of active yeast. In the meanwhile 25 gallons of must, obtained from clean, sound grapes, had been cleared of its sediment and yeast by settling with sulphurous acid. This was done by adding 1 ounce of potassium meta-bisulphite dissolved in one pint of water to 25 gallons of must. This had the effect of preventing fermentation until all sediment, including the moulds and yeast, in the must had settled. In twenty-four hours, must treated in this way was perfectly bright and was racked off into a clean cask which had been thoroughly sterilized by steaming. Must treated in this way is practically free from all fermentative organisms. Five gallons of this clear must were then freed from the sulphurous acid by

boiling and placed in a shallow tub which had been thoroughly cleaned and sterilized with boiling water. As soon as the must in the tub had cooled to 90°F., the gallon of yeast in the flask was added and the whole thoroughly aerated by dipping up the must with a gallon measure and pouring it through the air back into the tub. As soon as fermentation was well under way (twenty-four hours), 2½ gallons of the clear must were added without previous boiling. More than this should not be added for fear of the arrest of the fermentation which might occur if too much of the must containing sulphite were added at once. The next day, 5 gallons more of the clear sulphited-must were added. It was safe to add more this time as the yeast was becoming used to the sulphurous acid. Twenty-four hours later the remaining 12½ gallons of the sulphited-must were added.

In this way, at the end of six days, 25 gallons of must containing pure yeast were obtained practically free from moulds, bacteria, or wild yeast. In order to have a maximum amount of vigorous yeast in the must it should be thoroughly aerated several times every day, and fermented in a low, wide tub.

As soon as a stock of pure yeast is obtained in this way it can be kept up simply by replacing the yeast taken out with an equal quantity of clear sulphited-must prepared in the way described. During the vintage it is not necessary to crush and press grapes specially for this purpose, but the must can be taken directly from the vats or casks, care being taken to sulphite the must as soon as it is separated from the grapes before the slightest fermentation has commenced.

A stock of 25 gallons is sufficient for the fermentation of 2,000 gallons per day. Twenty gallons may be taken from the pure yeast tub every day and replaced with sulphited-must, and if the temperature is kept above 80° F. and the must is not too sweet (not over 22 per cent. B.) and sufficient aëration is given, the amount of yeast in the must will not diminish.

Every care should be given to prevent contamination of the yeast. The yeast tub should be kept covered with a clean cloth and should be placed in a room separate from the fermenting vats. All tubs, buckets, casks, hose., etc., used in the production of the yeast should be thoroughly sterilized with boiling water and not used for other purposes.

While it is not pretended that by these means, however carefully carried out, we are sure to obtain an absolutely pure culture of yeast, in the sense that it does not contain a single germ or cell of anything but the yeast we start with, it was found that, for practical purposes, it preserves the culture pure during the whole vintage. As we add the yeast to grapes containing spores and germs of many kinds or to imperfectly sterilized must, the few contaminating spores that may get into our pure yeast are quite harmless. This is true, however, only if we exercise well

the precautions indicated. If we allow vinegar flies to get at our yeast vats, or draw off the yeast with hoses used for racking wine or must, the yeast will quickly become badly contaminated.

Fermentation.—After the red must has been cooled and the yeast added, fermentation will start immediately. Within twenty-four hours the temperature will rise to 90° or 95°F., depending on the outside temperature and the size of the vat. Before it reaches 95°F. the fermenting must is passed through the cooler and reduced to 80°F. If the weather is not very hot, the vats do not contain more than from 1,000 to 3,000 gallons, and the original density of the must does not exceed 22% to 23% Balling, this cooling will be sufficient. Usually, however, if we are to have a cool fermentation, another cooling later will be necessary. In the experiments two coolings were always given, and wines containing over 14% of alcohol and in one case over 15% fermented out perfectly dry.

After Fermentation.—With musts containing no more than 22% Balling, it is possible to obtain perfectly dry wines in four to five days in the fermenting vats. To insure this a certain amount of aëration should be given at each cooling. This is accomplished simply by allowing the stream of cooled must to fall through the air a distance of three or four feet into the vat. The must will in this way carry down enough air to keep the yeast working vigorously. This aëration will at the same time get rid of any excess of sulphurous acid which may be present. In the experiment wines, this was accomplished so perfectly that only the faintest traces of the acid were found in the finished wines, an amount less than one-fiftieth of that allowed in French wines imported into the United States.

More aëration than is necessary for the completion of the fermentation should be avoided, on account of its effect on the colour, which is diminished in quantity and injured in quality by excessive exposure to the oxygen of the air.

With musts containing over 24% Balling it will usually be found impossible to ferment the wine perfectly dry in the four days, but it is inadvisable to leave it in the open fermenting vats any longer than this. At the end of four days, whatever the strength of the original must, the fermentation will be very slow. If the temperature, however, has never exceeded 95°F., it will not have ceased entirely, and every effort should be made to keep it going until the wine is perfectly dry. It is a capital mistake to allow the fermentation to stop and the yeast to settle while the wine still contains 5%, 1%, or even 2% of sugar, as is often done in the hope that the fermentation will recommence in the spring and eliminate this sugar.

At the end of four days in the open vat the wine should be transferred to a storage cask, however much sugar it still contains.

This transfer should be made with thorough aëration, and the receiving cask should not be sulphured. The wine should run in a stream which falls through the air into the pump-tub, or well, and should enter the storage cask through the upper bung-hole so that it will fall through the air in the cask, unless some other means is adopted for supplying the needed oxygen.

This aëration will reinvigorate the yeast and will usually be sufficient to keep the fermentation going until the wine is dry. The wine should be watched, however, and, if in seven days it is not dry, it should be aërated again by running it off from the bottom of the cask and pumping it back into the same cask. In the experiments this was found sufficient, even in cases where the resulting wine showed over 15% of alcohol, to bring the wine to dryness in three weeks from the time the grapes were crushed.

By this means the dangerous bacterial fermentations, which so often injure wines, even when they do not spoil them, during the one or two months following the vintage, will be avoided. The presence of a small quantity of sugar in the wine cannot be detected by means of the ordinary saccharometer or mustimeter used by cellermen. The saccharometer may descend to the 0 mark, or even considerably below in wines which contain over 1% of sugar. This is especially true of highly alcoholic wines, which are the most troublesome to get dry. The taste of the wine-maker is the only practical means of determining the presence of a dangerous residue of sugar in the wine.

So long as a taste of sweetness can be perceived in the wine by a practised taster, means should be adopted to keep the fermentation going. For this purpose, usually all that is necessary is an occasional aëration and stirring up of the yeast, as already described. Prompt action, however, is necessary. The wine should never be allowed to get cold before it is quite dry. If the wine is placed in puncheons or other small casks it is very useful, if not quite necessary, to keep it in a room where the temperature does not fall below 70°F. If it is placed in large casks (1,000 to 5,000 gallons, or larger), it will retain its heat for a sufficient time to become perfectly dry if the needed aëration is given.

If, even with these measures properly carried out, the wine still remains sweet, it means, provided the grapes used were not excessively mouldy, that the original must contained more sugar than it is possible for the yeast to eliminate. If the must contains more than 28% Balling, as will sometimes happen, especially when partially dried grapes are present, there is usually no possibility of fermenting it dry. In this case, the sugar may be eliminated by blending with a wine containing less than 12% of alcohol. This blending, however, must be done promptly, before either wine has become cold and before the wine containing sugar has become injured by bacterial fermentation. If a wine is not perfectly dry within seven

days after being transferred from the fermenting vat to the storage cask, an alcohol determination should be made. If there is more than a mere trace of sugar and the alcohol exceeds 14½%, the wine should be blended immediately with a weaker wine and aerated again.

First Racking.—While, so long as any sugar remains, our efforts should be directed toward keeping the yeast vigorous and suspended in the wine, we should use means to accomplish the opposite results as soon as the sugar has all disappeared and the wine is perfectly dry.

The function of the yeast is to change the sugar of the must into the alcohol of the wine. As soon as this is effected the wine should be freed from the yeast as soon as possible. If the fermentation has been conducted successfully, the yeast will commence to deposit immediately and the wine will be comparatively clear within two or three weeks after it has become dry. The first racking, then, should take place at this time and, as there is no need for further fermentation, the casks into which the wine is racked should be sulphured. This should be done with both red and white wines. The sulphur will remove a little of the colour in the former case, but some of this will return as the sulphurous acid disappears, and the colour remaining will be much more stable. Properly sulphured red wines will shew more colour at the end of six months than similar wines which have not been sulphured.

It is neither necessary nor advisable to wait until the wine is perfectly clear before making the first racking. All wines made by commercial methods contain a few bacteria and many of them a great many, and even when wines taste dry there is often a trace of sugar left which is sufficient to serve as nourishment for the bacteria. It is very desirable, therefore, to put the wine in such a condition that the bacteria will be deposited and the wine cleared as soon as possible. This is accomplished by racking without aëration, which eliminates the yeast and bacteria in the thick lees, and by sulphuring and cooling, which stop the action of the floating bacteria and cause them to be deposited.

After the first racking, or before, if the wine is perfectly dry to the taste, the cellar should be kept as cool as possible and the wine protected as much as possible from the air, in order to promote the settling of all the fine lees and hasten the perfect clearing of the wine.

(To be continued.)

LOCUST CONFERENCE.

Inter-Colonial Scheme for the Tabulation of Data.

A few months ago His Excellency the High Commissioner suggested that a Conference of representatives of the various Colonies and Territories be held at Pretoria for the purpose of discussing and formulating a concerted plan for the collection and distribution of information regarding the prevalence and movements of locusts in different parts of South Africa.

A meeting was finally arranged for August 20th. The Hon. Adam Jameson, the Transvaal Commissioner of Lands, occupied the Chair, and the delegates were welcomed and the Conference formally opened by Lord Selborne himself. The delegates were as follows:—

Mr. Adam Jameson (Transvaal Commissioner of Lands).
Mr. F. B. Smith (Transvaal Director of Agriculture.)
Mr. C. B. Simpson (Transvaal Government Entomologist.)
Mr. C. Fuller (Representing Natal.)
Mr. C. P. Lounsbury (Representing the Cape Colony.)
Mr. C. N. Johnson (Representing the Orange River Colony.)
Mr. R. Dumaesq (Representing the Orange River Colony.)
Mr. L. Wroughton (Representing Basutoland.)

The proposal that the various Governments be recommended to adopt a scheme as suggested by the High Commissioner was supported unanimously, though it was considered by some that a few of the advantages indicated would not be realised. After coming to a decision on the initial objects of the meeting, the delegates discussed locust matters in general and at the close of the proceedings adopted the subjoined resolutions, viz :—

1. That this Conference recommends the immediate establishment of a central bureau to be maintained for a period of not less than five years for the collection, tabulation and distribution of reports of locust swarms throughout the whole of British South Africa.
- 2.—It is recommended that the Governments of Portuguese East Africa and German West Africa be invited to co-operate.
- 3.—It is recommended that the bureau shall be under the direction of a Committee comprised of one representative from each contributing Colony or territory.
- 4.—It is recommended that the bureau be located in Pretoria, and that the funds contributed to its upkeep be administered by the Director of Agriculture of the Transvaal.
- 5.—That the Committee shall hold an annual meeting at a time and place to be agreed upon by a majority of the members. An extraordinary meeting of the Committee may be held at

- any time at the request of two or more of the contributing Colonies or Territories. Three members shall constitute a quorum at any meeting.
- 6.—It is recommended that the cost of the bureau, which shall not exceed £500 during the first year, be borne by each Colony or Territory in accordance with the recognised scale.
 - 7.—It is recommended that each Colony make arrangements for collecting information regarding the position and movements of swarms of locusts within its borders, and that it transmit the same with all possible despatch to the bureau, together with any details that may be available.
 - 8.—It is recommended that the bureau receive and tabulate the information so forwarded and from time to time, as may be deemed necessary, issue maps and memoranda to each Colony or Territory concerned shewing the latest position and probable movements of swarms of locusts, and further when possible, any special information desired by any Colony or Territory.
 - 9.—That this Conference expresses itself in favour of locust legislation on the lines adopted in Natal.
 - 10.—That in the opinion of this Conference the chief measure of control is in the destruction of locusts in the wingless or voet-ganger stage, and this Conference urges upon the Governments of the various Colonies and Territories to take steps to make the ease and low cost of destroying locusts by the sweetened arsenical solution universally known to farmers in locust-infested regions. Further, this Conference wishes to add that from the experience of the members composing it, despite the highly toxic properties of the solution, very little danger has resulted or is likely to result from the general adoption of this treatment to poultry, stock or man.
 - 11.—That this Conference is strongly of opinion that each of the South African Colonies or Territories should take measures as far as possible to ensure the prompt destruction of all voet-gangers hatching out within its borders.
 - 12.—That in the opinion of this Conference it is necessary that, in order to secure the general destruction of locusts, qualified officers should be employed under each Government and controlled by the Department of Agriculture of such Government to demonstrate to the farmer in every infected area the measures recommended.
 - 13.—That owing to the immense loss to the Transvaal and the Orange River Colony caused by the ravages of locusts hatched in Griqualand West and Bechuanaland this Conference strongly represents the importance of action on the part of the Government of Cape Colony in dealing with the pest in those parts of its area.

NOTES ON THE PRICKLY PEAR.

BY DR. ERIC A. NOBBS.

Of noxious weeds the Cape Colony has full share and of all its weeds there is none more prominent and few, if any, as harmful as the prickly pear. Few weeds have spread so systematically over the face of the country and no other has become such a characteristic feature of the landscape.

The prickly pear is essentially the weed of the Karroo, of the dry bare uplands and of dry climates. It is not strictly limited by depth of rainfall or by character of soil but it prefers dry air, volcanic ground and a hot summer. At the same time it is not hypersensitive and will grow almost anywhere where it is not wanted, from a galvanised iron roof downwards.

It has been estimated that at the present day it covers half a million morgen in the Colony and certain it is that the area is not diminishing.

The prickly pear is known in one form or another all over the Colony. In certain portions, the moister grass veld, the Western Province and the coast belt, while it grows well, it is yet readily kept in check, and hence is commonly utilised for hedges and ornament. The fact that it is not everywhere a menace renders very difficult the problem of eradication by legal enactment as it is obviously a hardship to compel a man to destroy a useful fence round his kraals lest haply a leaf or fruit should be carried to the next division where it is liable to spread.

To bring prickly pear under the operations of the law as applied to *Xanthium spinosum* and other noxious weeds would on the other hand be a far greater hardship, indeed there are many farms where extirpation will cost more than the land to be cleared is worth, while there are many others where, whatever the gain, yet it would cost more to clear than the farmer can afford.

The districts where prickly pear may be regarded as a serious pest include :—Albany, Alexandria, Bedford, Cradock, Fort Beaufort, Graaff Reinet, Humansdorp, Jansenville, King William's Town, Murraysburg, Oudtshoorn, Port Elizabeth, Queenstown, Somerset East, Steynsburg, Steytlerville, Stockenström, Swellendam, Tarka, Uitenhage, Umtata, and Willowmore.

A much discussed question is the extent of the loss the Colony annually sustains through prickly pear. Owing to lack of proper statistics it is hopeless to attempt to fix even approximately any such figure. The evils too are not entirely such as can be expressed in terms of money. In the report of a select committee

which considered this matter in 1898, the case against the prickly pear is summed up. Farms which formerly were used for stock grazing "are now useless for pastoral purposes while the owners have been almost ruined, thus causing great suffering and loss to the revenue." And further on it states: "In some of these districts the plant is still rapidly spreading, thousands of stock are still annually killed from its effects: in parts of the old affected farms it has become so dense that no animal can pass through it, while the owners and occupiers have become so poor that they are dragging out a miserable existence, living principally upon the fruit. These people have now fallen into such a poverty-stricken condition that their children are growing up uneducated, and are becoming a threatening danger to the country. Besides these evils the prickly pear is having a demoralizing effect upon the natives. During six months of the year the fruit provides them with a means of subsistence and they have consequently contracted idle and thievish habits, and the farmers in the neighbourhood are losing stock, which are secreted in these thickets and slaughtered at convenience. From the fruit of the prickly pear the natives manufacture an intoxicating drink, which our native servants indulge in frequently, thus rendering themselves unfit for service and causing serious disturbance on the farms." 2880

This severe indictment is confirmed in the report of the Select Committee which went into the question during the last session of Parliament, and which alludes to "the serious losses of stock, the reduced stock-carrying capacity of land, the material impoverishment of the community, the increase of stock thefts and the demoralizing effect upon the natives, all attributable to the spread of the prickly pear."

Common as the prickly pear is, there yet appears to be a doubt as to the proper botanical description. In evidence before the recent Committee Dr. Marloth, of Cape Town, stated that it is either *Opuntia ficus-indica* or *Opuntia tuna*. There are many other species of prickly pear all more or less objectionable. The scientific nomenclature is however a matter of minor importance. A much more vital fact laid down by the same authority is the specific identity of the thorny and spineless varieties. Dr. Marloth stated in evidence: "The opinion I have formed from my experience is that the "doornblad" has reverted from the "kaalblad". I do not think the "doornblad" was here originally, but through a series of generations, and always growing from seed, it has reverted to the original wild variety. The "kaalblad" is a cultivated variety. In its native home, America, they have by cultivation improved the original and reared the "kaalblad". That has been introduced into the Mediterranean countries and here, and by being left to itself and allowed to re-produce itself from seed constantly—not in one generation and from the first seed, but from the seeds of the first seedlings when they have

grown up, and so on over a length of time—it has reverted to the spiny stage.”

This dispels the hopes of those who thought to be able to get rid of the one kind and yet leave the other. Such an attempt would be quite ineffectual.

The first introduction of this pest into the Colony dates back to a very early period in our history. In a report written in 1892 Dr. Marloth wrote: “It appears that also our common prickly pear was brought here by Dutch East Indiamen to use it for fences. That it was imported from Madeira for the purpose of cultivating the cochineal is hardly possible, for the attempts to start this industry there are of comparatively recent origin, and have not been successful. Even on the Canary Islands the cochineal insect was introduced only some fifty or sixty years ago. Of course the prickly pear, which is the same species as our common kind, existed long before on all those islands.”

The prickly pear was introduced from America, its native home, at an early date to the Mediterranean countries, where it flourishes, though it does not appear to become a pest; on the contrary it is highly valued as an article of diet for the poorer classes. It seems highly probable that it reached the Dutch East India settlements from there and so came to the Cape.

In whatever way the prickly pear reached South Africa, it certainly found congenial surroundings and has thoroughly established itself.

It is curious that no active measures seem to have been taken against the prickly pear until comparatively lately. It first received parliamentary recognition in 1890, since when four separate select committees have sat upon it. In 1891 the Agricultural Department conducted some experiments with different exterminators and various processes. Mr. A. C. Macdonald, Agricultural Assistant, was in charge of this work, the ultimate outcome of which was the recommendation of the process now generally adopted, that of stubbing out the trees by the root, piling them up in heaps and spraying with arsenite of soda solution, one pound in nine gallons of water. Originally the arsenite of soda or Government exterminator as it is often called, was sold at 2½d. per lb; from 1898 it was distributed free, and lately it has been sold at cost price to the farmers. In this way since the commencement of the system in 1893 some 425 tons of arsenite have been imported at a cost of considerably over £15,000. No doubt much good has resulted and a large area has been cleared by this means, while unquestionably also the further spread of the prickly pear has in many instances been arrested. There have been great difficulties to contend with in this matter; the demand has been spasmodic and very erratic, while the sums voted have also fluctuated considerably from year to year, rendering the supply and hence its distribution irregular and unreliable.

The method adopted in this country has found confirmation elsewhere and careful experiments conducted in New South Wales in 1901, brought out the fact that of the various materials used, arsenite of soda applied in a strength of 1 lb. dissolved in 8 gallons of water gave the best results, closely bearing out the conclusion previously arrived at here.

The prickly pear is also a pest in New South Wales where a Prickly Pear Destruction Act for its compulsory eradication is strictly enforced (Act 250 Victoria, New South Wales, 30th July). Under this law Crown Land in the outlying districts where prickly pear occurs are leased for a term of years at a low rental, about 6d. per acre per annum conditional to the destruction of all prickly pear within a specified time. In the settled districts of the Colony eradication without state aid in any form is compulsory. Owners of land have to give notice of the presence of prickly pear on their land. Inspectors traverse the country and wherever they find the pear they serve a notice on the owner or occupier to eradicate. He must commence operations within a month, subject to a penalty of £10 and an additional £5 for every further delay of twenty-eight days. Should no effort to eradicate be made, the inspector may clear the land at the owner's expense but ceases operations if the owner then commences on his own account. It is not suggested that such procedure should be adopted here where the conditions are somewhat different, but it is only along some such lines that it can ever be hoped that we shall be able effectively to deal with the evil.

In Queensland the individual has been left to cope with the trouble, but at one time a reward of £5,000 was offered to anyone discovering a remedy. No award has yet been made nor does it seem likely to be claimed. The farmers there use arsenite of soda costing 3d. to 3½d. per lb.,—dearer than with us.

In Mexico and South Texas eradication does not appear necessary, the use of the pear in time of severe drought keeps it sufficiently in check.

The inquiries of the Select Committee brought to light quite a number of preparations recently devised for the destruction of prickly pear. Some are patented or protected, the composition of others is secret. The basis of most is probably arsenic in one form or another and it remains to be determined whether any of the other ingredients are active or essential.

Extended trials are being conducted of these various specific remedies and comparisons will be made of their relative merits. It is hoped that the outcome may be the discovery from amongst them of a remedy simpler, cheaper and more effective than the present process; time will show.

Recently one such proprietary poison has attracted considerable public attention. Mr. P. Pienaar's patent preparation for prickly pear has been tried and used successfully by a number of

farmers. On a large scale perhaps this has been done by the municipality of Uitenhage on the extensive commonage upon which the prickly pear grows thickly, but in clumps. The treatment is considered to have been thoroughly successful and a careful count has been kept of the cost which worked out some little time ago at over 25,000 trees averaging between six and eight feet high destroyed at a total cost for labour, material and supervision, of £168 13s. or a little over 1½d. per tree.

The question of the eradication is complicated by the fact that the prickly pear is not everywhere regarded as entirely an evil. During all ordinary times no doubt it is so, but in some localities it serves as a valuable famine food though even as such it is recognised as not without serious drawbacks. In the recent severe droughts thousands of ostriches were kept alive on prickly pear and mealies. In some of the drier tracts of the Colony the cattle may be said to subsist on prickly pear. Donkeys will not let it alone. The ill effects seem to shew themselves only by slow degrees and for short-lived animals like pigs it may have value as a succulent, if innutritious diet. None the less it is admitted even by those who use it most that it is a last resort and only taken for lack of better food. It would probably be true to say that in such cases had there been no prickly pear on the place the farm would in good seasons have carried far more stock, and that there being more herbage where prickly pear is absent the period of scarcity would have been longer delayed or less severely felt. In either event the farmer would have been better able to meet the drought. The unthrifty appearance of cattle running in prickly pear is well known and the state of their internal organs when examined explains at once their chronic indigestion and poverty and gives colour to the common belief that prickly pear is a fertile cause of lamziekte.

In Mexico, in Texas, and in Australia, in time of drought the prickly pear is burnt to remove the spines before being fed to stock just as is done in this country; occasionally a torch is used instead for this purpose. At one time steaming to soften the spines was commonly resorted to. Attempts to turn the prickly pear into ensilage do not seem to have met with much success, and on the whole it has been found that, although such methods have at times been highly recommended, the final conclusion is, that prickly pear is not a wholesome diet. It is at best only a makeshift during time of drought.

In Southern Europe as in Cape Colony the fruit is largely used for human food; it is also distilled, and a spirit obtained from it.

The common practice in this Colony for the eradication of prickly pear, is the expensive and tedious, but effective one of stubbing the trees, usually by contract labour, piling them in heaps on a foundation of thorn or other bush and then wetting the heap with arsenite of soda. This solution is best prepared by dissolving

the arsenite in boiling water, say 1 lb. in 2 gallons then adding this to 6 or 7 gallons of water giving a solution of the proper strength.

When arsenite is unprocurable or the pear is to be fed to stock then additional bush is cut and the pear burnt.

This work is best carried on during the non-active period from 1st March to 1st September.

In New South Wales mere spraying of the standing trees with a 10 per cent. solution of arsenite of soda, 1 lb. to 10 gallons of water, is recommended for application during the months the sap is flowing, but this it is admitted while killing the green joints does not kill the roots so that the stumps shoot out again and the work has to be done over again from time to time.

The various remedies now being brought before the public required to be applied as injections or doses of a few spoonfuls poured into holes previously bored with an auger in the stem. Whether in all cases this will be fatal both above and below ground remains to be seen. It is claimed that these preparations are effectual at all seasons.

As already stated the department is conducting an enquiry into the best methods of eradication and a comparison of the different preparations recently introduced.

The regulations now in force (Government Notice 729 of 1905) are printed for the information of those interested.

SCRUB EXTERMINATOR.

It is hereby notified that application for Scrub Exterminator (Arsenite of Soda) for the eradication of Prickly Pear and Jointed Cactus, accompanied by the necessary remittance, must be made to the Magistrate of the District in which the land is situated.

The Scrub Exterminator will be obtainable at any depôt now or hereafter established for the purpose, at a prepaid charge of £1 10s. (One pound ten shillings sterling) per drum of 140 lbs., delivered at the depôt.

The quantity to be issued to any person at one time will be in no instance exceed five (5) drums.

The depôts at present established are shewn in the Schedule hereto.

CHARLES CURREY,
Under Secretary for Agriculture.

Schedule.

The following are the depôts at present established :—

Aberdeen	...	Civil Commissioner's Office.
Adelaide	...	J. Lamont.
Alexandria	...	Civil Commissioner's Office.
Bedford	...	J. B. Gunn.
Cookhouse	...	Macdonald Bros.
Cradock	...	S. G. N. Webber & Co.
Fort Beaufort	...	Civil Commissioner's Office.
Graaff-Reinet	...	Tunstall & Co.
Grahamstown	...	J. H. Parker.
Humansdorp	...	Civil Commissioner's Office.
Jansenville	...	(J. F. Heydenrich, Jansenville.
King William's Town	...	(C. Lee, Claremont, Klipplaat.
Murraysburg	...	Civil Commissioner's Office.
Oudtshoorn	...	" " "
Port Elizabeth	...	P. Matare.
Queenstown	...	Civil Commissioner's Office.
Somerset East	...	" " "
Styensburk	...	{ Berry & Co., Somerset East.
Steytlerville	...	{ G. Webster, Middleton Nek.
Stockenström	...	{ C. W. Smuts, Pearston.
Swellendam	...	Civil Commissioner's Office.
Tarkastad	...	" " "
Uitenhage	...	" " "
Umtata	...	{ W. M. Atkinson, Kleinpoort.
Willowmore	...	{ Civil Commissioner's Office.
	...	{ Resident Magistrate's Office.
	...	{ Civil Commissioner's Office.
	...	{ W. Geard, Heuvel Kraal.

POULTRY FOR PROFIT.

CHAPTER VI.

Foods and Feeding.

In order to deal with this subject fully, a couple of volumes of large dimensions might be written without embracing all points of interest. However, in a concise form I hope to assist some to prepare a properly balanced ration. Below will be seen a list of grains etc., showing their relative values.

Foods.	Nutritive Ratio.	
	Protein.	Carbo-Hydrates and Fat.
Wheat	1	9.9
Screenings (wheat)	1	5.2
Mealies	1	12
Oats	1	6.8
Barley	1	8
Buckwheat	1	7
Rye	1	10
Peas	1	2.8
Rice	1	15
Kaffir Corn	1	8.1
Bran (wheat)	1	3.8
Bran (rye)	1	5
Bran (oats)	1	4.3
Middlings (wheat)	1	4.8
Middlings (oats)	1	4.3
Middlings (buckwheat)	1	2.1
Shorts (wheat)	1	4.8
Oat hulls (ground)	1	17
Corn Meal	1	12.9
Barley Meal	1	9.3
Pea Meal	1	3.2
Linseed Meal	1	1.6
Cotton Seed Meal	1	1.2
Beef Scraps	1	1.3
Green Bone	1	2.3
Blood Meal	9.7	7.2 Fat.

In the above table carbo-hydrates and fat have been placed in one column. They are both used for the same purpose, but as fat is about 2.25 times more effective than the same quantity of starchy matter it has been brought upon a level with the carbo-hydrates by

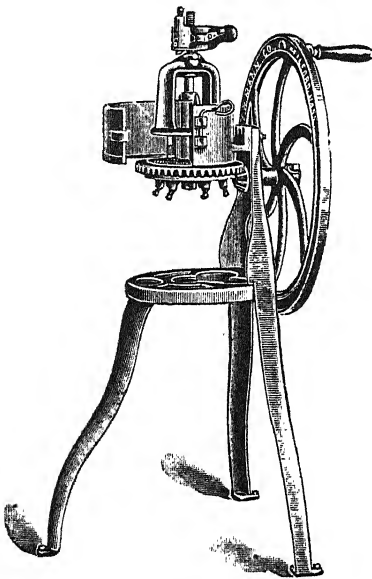
multiplying it in each case by 2.25. As it is mainly a question of proportion the bringing of these two items under one head simplifies matters. The respective value of protein, carbo-hydrates and fat has been given so that the reader will have little difficulty in forming his opinion as to the merits of each variety of grain etc. Of course, we must remember that in order to arrive at a correct conclusion of the value of foods, we must include in our estimate the digestibility of the component parts of the grain etc., in question.

To feed successfully requires a great deal of care and thought. It is a mistake to feed a fattening ration to young growing cockerels which shew a sign of leg weakness and it would be absurd to feed a fattening ration for any length of time to hens from which we expect a large quantity of eggs. Laying hens requires an egg producing ration and young birds require a bone and muscle forming ration. Market fowls, should have a ration to produce the desired effect. Fowls that are moulting need feather-making material and if it is late in the season they require more than the average amount of heat-forming grain.

The reader will easily see from the foregoing that feeding your birds does no mean simply throwing so many lbs. of grain or meat, at stated times. In order to feed and feed properly we have to provide for the growth of the body, production of heat and the replacing of lost tissue, and in the food there must also be bone and feather forming material especially for young bird feeding. In feeding there may be different objects in view viz.: Egg production, fattening, raising chicks, preparing for show, etc., etc. These different branches of course call for different feeds, that is that each ration will be suited to the object in view. There is no hard and fast rule as regards feeding or the amount of food to be given, different breeds require different treatment. Suppose your stock of grain is composed of oats, wheat and mealies, in one case it may be advisable to use equal parts of each, in another it may be better to use double the quantity of wheat to each part of rye, and oats, while in a third case it may be desirable to use more mealies or oats. The apportionment of these different foods is called balancing the ration. Of course it is impossible to compose a thorough food on these grains alone. Meat and vegetable food is also necessary as well as grit and shell. It would be extremely difficult, nay impossible, to give the exact analysis of grain, etc., the aforesaid table may be taken as an average and sufficiently accurate for all practical purposes.

Animal food must be provided, birds in a wild or natural state, thrive best during the months the food is obtainable. The best meat food to use is beef scraps and it may be bought at a low price locally. I do not by any means recommend a cheap quality beef scraps. I usually pay 22s. 6d. per 100lbs., which is reasonable. Green food is also a necessity, and is sometimes very hard to obtain.

When vegetables are scarce, Swiss clover mixture, which should be steamed over night, that is boiling water poured over it and allowed to stand till the following morning, and then mixed with the ordinary mash, with a handful or two of beef scraps, (also steamed overnight) mixed through it. On no account feed sloppy foods. The mass should be crumbly. "Sloppy" foods in my opinion mean death to chicks especially, and in fully grown birds are a producer of diarrhoea. I cannot close the chapter without a word on green bone and grit, two very important items. Green bone is, as mentioned in a previous chapter, raw butchers' bone which must be cut so as to enable the fowl to eat it. I have obtained the following particulars in reference to green bone



Green Bone Cutter.

cutters from Messrs. G. Findlay & Co., also block of green bone cutter which they have kindly placed at my disposal. These machines are stocked by this firm in three sizes. The smaller for bolting down to a bench or table. the two larger sizes on cast iron stands. The prices are from £2 10s., to £3 15s. They are subject to this guarantee that if any part of the machine breaks inside twelve months with fair usage, the broken part will be replaced free of charge. The machines are moderate in price and will pay for themselves in less than a year. I have one in use at present and I must say it is very satisfactory. Grit seems to be thought unnecessary by some people, but it is just as important

as food, for without it birds cannot digest their food properly. Grit to be of any use must be sharp. Mica crystal grit is in my opinion the best. Flint grit the longer it is in the gizzard the more the sharp edges are worn off, but with mica grit the longer it is in the gizzard the sharper it becomes as the mica dissolves.

In feeding grain a variety is always necessary, that is a change of grain now and again. Changes are healthful, and a great many successful breeders owe their success in no small measure, to the change of diet or grain which they make periodically. Some people may smile at a variety of grain being recommended, but from practical experience and observations, I believe it is most beneficial. From the table of grains it should not be a difficult matter to mix your food with the proper amount of carbo-hydrates,

fat and protein. Water is naturally contained in all grains, therefore, that is a question we need not discuss. Ash also is required for bone forming, it is chiefly composed of potash, lime magnesia and iron and as most foods contain a quantity of ash no difficulty is experienced in the supply of ash. Next month "Chicken feeding."

SHAMROCK.

PRIZES AT THE CRYSTAL PALACE EXHIBITION.

The following prizes have been awarded to South African firms at the International Exhibition of Health, Food and Hygiene, at the Crystal Palace, London :—

H. C. Collison, Ltd., Gold Medal for Cabernet Sauvignon, Red Muscadel and F. C. Brandy, Silver Medal for Drakenstein, and old Montagu Dop. Special prize for Hermitage.

E. K. Green & Co., Ltd., Gold Medal for Pale Sherry, Port Wines, and Sauvignon Blanc. Silver medal for White Malmsey and Van der Hum. Special Prize for Tinto.

R. Cloete Esq., Wynberg, Gold Medal for Van der Hum.

Cape Government, Diploma of Honour for Collective Exhibit.

Western Province Preserving Co., Orchard Siding, Gold Medal for Bottled Fruits.

Western Wine, Brandy & Spirit Co., Ltd., Paarl, Gold Medal for Eucalyptus Liqueur, Silver Medal for Kimberley Club Sherry, Cognac and Muscadel; Special Prize for Curacao.

Shepherd Bros., Stellenbosch, Gold Medal for Preserved Fruits.

E. T. L. Edmeades, Oudtshoorn, Gold Medal for Walnuts.

J. C. Raubenheimer, Seymour. Gold Medal for Rolled Tobacco.

J. H. Sturk & Co., Cape Town. Gold Medal for Tobacco and Cigars.

W. J. Van der Veen, Oudtshoorn. Gold Medal for Rolled Tobacco.

Blatter & Co., Cape Town. Gold Medal for Calabash Pipes.

Chas. Ayres, Cape Town. Silver Medal for Artistic Silver Leaf Work.

Miss S. Connor, Cape Town. Silver Medal for Fish Scale Work.

The Vasco Natural Mineral Water Co., Ltd., Cape Town. Silver Medal for Mineral Waters.

The Van Riebeeck Natural Mineral Water Co., Ltd., Cape Town. Silver Medal for Mineral Waters.

**Information Regarding the PRECIOUS MINERALS,
PRECIOUS STONES and BASE MINERALS ACTS,
for the guidance of PROSPECTORS, OWNERS of
FARMS, LESSEES of CROWN LAND and others.**

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Special Note. As to proclamation of a mine, etc.

Before the place where precious minerals or precious stones have been discovered can be proclaimed a mine or reef digging or alluvial digging, as the case may be, the law requires that the Governor shall take such steps as he may deem fit for the purpose of testing the character, payable qualities and extent of such place. The object of this requirement is obvious, but the matter is specially mentioned in order that prospectors may clearly understand that proclamation cannot immediately follow discovery.

The Precious Minerals Act (No. 31 of 1898, as amended by Act No. 45 of 1905) and the Precious Stones Act (No. 11 of 1899) affect crown land and private property the title to which contains a reservation to the Crown of precious minerals (*i.e.*, gold, silver and platinum) and precious stones.

PROSPECTING AND RIGHTS OF PROSPECTOR.

1. Anyone intending to prospect for precious minerals and precious stones, must first take out a licence, procurable at the office of any Civil Commissioner in the Colony, not necessarily the Civil Commissioner of the Division in which it is proposed to prospect, on satisfying that officer that the applicant is a person of good character. The cost of a licence is 2s. 6d. for each month, and the period for which it may be held is one, two or more months, but not exceeding twelve months.

2. For precious minerals the prospecting area, that is, the area within which prospecting may be carried out, is a rectangular area 7,500 feet long, and 800 feet broad, at each corner of which the prospector is required to put in pegs of not less than two feet in height above the ground.

3. For precious stones the prospecting area is a circular area one thousand yards in diameter, at the centre of which the prospector is required to erect a beacon and affix thereon a sign-board bearing the words, "Centre of Prospecting Area under Licence No. issued by the Civil Commissioner of" and the name of the prospector.

4. A prospecting licence gives the holder the exclusive right to prospect upon crown land and also upon private property, provided, as regards the latter, that the consent of the owner or of the lessee, if the land be leased from the Crown, has first been obtained. There are, however, certain areas within which prospecting is prohibited as defined in the note to the licence (see form of licence, paragraph 36). A prospector has also the right, during the currency of his licence, to move his pegs or beacon to any other spot on crown land lawfully open to him, provided such spot or area does not interfere with the prospecting area of any other duly licensed prospector; he has also the right, on crown lands, of grazing for six horses or mules, or for sixteen oxen, and of taking wood and water for his domestic use; further he must, under the Precious Minerals Act, prospect *bona fide* to the satisfaction of the Governor, and if he fail to do so, the licence may be cancelled forthwith as far as the area is concerned, and the holder not again permitted to prospect within the area for a period of six months, and the area thereupon becomes open to any licenced prospector to prospect thereon.

5. Removal or destruction of a prospector's pegs or beacon or prospecting within a prospector's prospecting area without his consent is an offence punishable by a fine not exceeding £50 or

imprisonment with or without hard labour for a period not exceeding six months.

6. Prospecting without licence is an offence punishable by a fine not exceeding £100 or imprisonment with or without hard labour for a period not exceeding twelve months, except prospecting by (a) an owner of private property on his property; (b) a lessee of private property on such property who has leased the owner's rights in respect to precious minerals or precious stones and has registered the lease in the office of the Registrar of Deeds with the title deeds of such land; (c) a lessee of land from the Crown, on such leased land. An owner or lessee is not bound to allow prospecting on his land, but is at liberty to give a licenced prospector permission to do so on such lawful terms and conditions as may be agreed upon.

DUTY OF A PROSPECTOR FINDING PRECIOUS MINERALS.

7. A prospector finding any precious mineral must forthwith give notice of his discovery to the Civil Commissioner of the Division in which he has found such mineral. Failure to give such notice is punishable by a fine not exceeding £50 or imprisonment with or without hard labour for a period not exceeding six months.

8. A prospector finding any precious mineral in *payable quantities* must forthwith make a solemn declaration* of such finding and lodge such declaration with the Civil Commissioner of the Division in which the mineral has been found. Failure to make such declaration is punishable by a fine not exceeding £50 or imprisonment with or without hard labour for a period not exceeding six months. Any person knowingly making a false declaration is liable to such punishment as the law provides for the crime of perjury.

The placing of minerals on places where not naturally found in order to induce the prospector to make a declaration or to mislead anyone is punishable as fraud. The onus of proof that he has not so placed minerals rests with the accused.

DUTY OF A PROSPECTOR FINDING PRECIOUS STONES.

9. A prospector finding any precious stones must within one month give notice thereof to the Civil Commissioner of the Division in which the find has been made, and thereafter once in each month, during any part of which he prospects at the place where he has made the find, must make a solemn declaration* of of the number and the value of the precious stones found by him and of the amount of the ground measured in loads of sixteen cubic feet to each load which has yielded the precious stones and lodge

* (The Act does not prescribe the exact wording to be employed in making this solemn declaration. A form, however, which may be found useful is given in paragraphs 34 and 35.)

the declaration with the Civil Commissioner of the Division. Failure to give such notice or make such declaration is punishable by a fine not exceeding £50 or imprisonment with or without hard labour for a period not exceeding twelve months, and further involves forfeiture of the prospecting licence and all benefit under it. Any person knowingly making a false declaration is liable to such punishment as the law provides for the crime of perjury. The placing of precious stones on places where not naturally found in order to induce the prospector to make a declaration or to mislead any one is punishable as a fraud. The onus of proof that he has not so placed the precious stones rests with the accused.

DUTY OF OWNER OR LESSEE OF PRIVATE PROPERTY AND OF LESSEE OF CROWN LAND FINDING PRECIOUS MINERALS OR PRECIOUS STONES.

10. An owner or lessee, as described in (a), (b) and (c), of paragraph 6, finding any precious minerals or precious stones while prospecting is under the same obligations as a licenced prospector as to reporting, etc., his finds, as detailed in paragraphs 7, 8, and 9. Failure to comply with these obligations renders him liable to the forfeiture of all his rights under the Acts.

RIGHTS OF DISCOVERER OF PRECIOUS MINERALS IN REEF IN PAYABLE QUANTITIES.

11. A prospector who has made the declaration described in paragraph 8, and who proves to the satisfaction of the Civil Commissioner that he has found the precious minerals in a reef in payable quantities has the right to peg out twenty-five claims in block, if on private property, and fifty claims in block, if on Crown land, at the place where such minerals have been found, upon the proclamation of the place as a reef digging and is given a certificate by the Civil Commissioner that he is entitled to such claims. Upon the granting of this certificate, the prospector's right to prospect under his licence within the place to which this certificate refers, ceases. These claims must be pegged out prior to the pegging out of any other claims in the digging, and shall remain free of licence moneys as long as they are held by the discoverer in his own right. The size of a claim in a reef digging is 150 feet in the direction of the reef and 800 feet broad either across or on the one side of the reef. When the discovery is made on *private property* the discoverer must select his claims within the limits of such property. When the discovery is made on *crown land* the claims must be selected so that in the direction of the reef they shall be entirely within the prospecting area, but in breadth across the reef so that they may fall partly within and partly without such area.

12. A discoverer of minerals in reef in payable quantities is not entitled to the claims mentioned in paragraph 11 if the discovery made by him is one of the same continuous reef as that

in respect to which a certificate has been granted, unless the place of discovery be distant at least six miles from the place referred to in such certificate. If a prospecting area be included in a proclaimed reef digging, any prospector holding a prospecting licence current within the boundary of such digging at the date of proclamation is entitled to peg out two claims within the boundaries of the digging, and to have the same registered in his name before general pegging out of claims takes place, on payment of the licence money thereon one month in advance.

13. If within three months of the granting of the certificate mentioned in paragraph 11, a reef digging is not proclaimed at the place to which the certificate refers, the holder of the certificate has the right to peg out twenty-five claims in block within the limits of such property, and to hold such claims with the same rights and obligations as if such place had been proclaimed a reef digging, subject, however, to the terms and conditions of any arrangement made by him with the owner, when such place is on private property. These claims and any transfer of them must be registered with the Registrar of Claims in the same way as if they were claims in a proclaimed digging.

It is competent for the Governor at any time to proclaim the place a reef digging, including the pegged out claims.

14. If within three months of the granting of the certificate mentioned in paragraph 11, a reef digging is not proclaimed at the place to which the certificate refers, the holder of the certificate, *when the place is on crown land*, may be granted by the Governor a lease of such portion of crown land, including the prospecting area in which the discovery has been made, but not exceeding 100 morgen (a morgen 2.116541 acres), as to the Governor may seem expedient, together with such depositing sites and servitudes on crown land adjoining the portion leased as may be necessary for the proper digging for minerals in such portion. The lease shall be for five years, renewable at the option of the lessee from time to time for further periods of five years at an annual rental of 10s. per morgen in respect of the portion leased. The lease, in addition to the ordinary rights of a lessee of farm land, gives the lessee the sole and exclusive right to all minerals in the portion of land leased and the right to sublet, assign, or alienate the lease.

15. A bonus of £5,000 is payable by the Government to the first discoverer of gold in a reef in any Division of the Colony if within five years after such discovery at least twenty-five thousand ounces of gold shall have been registered as extracted from that reef within such Division.

RIGHTS OF DISCOVERER OF PRECIOUS MINERALS IN ALLUVIAL IN PAYABLE QUANTITIES.

16. A prospector who has made the declaration described in paragraph 8, and who proves to the satisfaction of the Civil

Commissioner that he has found precious minerals in alluvial in payable quantities, has the right to peg out twenty claims in block at the place such minerals have been found *upon the proclamation of the place as an Alluvial Digging*, and is given a certificate by the Civil Commissioner that he is entitled to such claims. Upon the granting of such certificate, the prospector's right to prospect under his licence within the place to which the certificate refers, ceases. These claims must be pegged out prior to the pegging out of other claims in the digging, and shall remain free of licence moneys as long as they are held by the discoverer in his own right. The size of a claim in an alluvial digging is 150 feet by 150 feet, but the the Inspector, on being satisfied that the quality of the ground or difficulty in working necessitates alteration or extension of size, may, with the consent of the Minister, grant special claims of irregular form and containing a total area not exceeding 20,000 feet.

17. If within three months of granting the certificates mentioned in paragraph 16 an alluvial digging is not proclaimed at the place to which the certificate refers, the holder of the certificate has the right to peg out twenty claims with the same rights and obligations as if such place had been proclaimed an alluvial digging, subject, however, to the terms and conditions of any agreement made by him with the owner of the property, when such place is on private property. These claims and any transfer of them must be registered with the Registrar of Claims in the same way as if they were claims in a proclaimed digging. It is competent for the Governor at any time to proclaim the place an alluvial digging, including the pegged out claims.

18. If within three months of the granting of the certificate mentioned in paragraph 16 an alluvial digging is not proclaimed at the place to which such certificate refers, the holder of the certificate, *when the place is on crown land*, may obtain a lease of an area as described in paragraph 14, upon the conditions mentioned in that paragraph.

19. A bonus of £5,000 is payable by the Government to the discoverer of any alluvial digging in any Division, distant not less than ten miles from a previously registered claim in an alluvial digging, and from which in the space of two years at least twenty-five thousand ounces of gold have been registered as extracted therefrom.

RIGHTS OF DISCOVERER OF PRECIOUS STONES IN PAYABLE QUANTITIES ON PROCLAMATION OF PLACE OF DISCOVERY AS A MINE.

20. A prospector who has made the declaration described in paragraph 9, and who proves to the satisfaction of the Civil Commissioner that he has found precious stones in payable quantities

(not in alluvial in regard to which see paragraph 22), has the right to select fifty claims in block at the place where such precious stones have been found on its being proclaimed a mine and is given a certificate by the Civil Commissioner that he is entitled to such claims. Upon the granting of such certificate the prospector's right to prospect under his licence within the place to which such certificate refers ceases. These claims must be selected prior to the allotment of any other claims in the mine and shall remain free of licence moneys as long as they are held by the discoverer. The size of a claim in a mine is a square figure measuring not more than thirty feet each way. If a prospecting area be included in a proclaimed mine the holder of a prospecting licence current within the boundaries of the mine at the date of its proclamation or any extension is entitled on payment of licence money one month in advance to select two claims within the boundaries of the mine after the discoverer and the owner have selected the claims to which they are entitled, and to have these claims registered in his name.

21. If within three months of the granting of the certificate mentioned in paragraph 9 a mine is not proclaimed at the place to which the certificate refers, the holder of the certificate has the right to beacon off fifty claims in block at such place and to hold such claims with the same rights and obligations as if such place had been proclaimed a mine, subject, however, when such place is on private property, to the terms and conditions of any agreement between himself and the owner of the property. These claims and any transfer of them must be registered with the Registrar of Claims in the same way as if they were claims in a proclaimed mine. It is competent for the Governor at any time to proclaim the place a mine including the pegged out claims.

RIGHTS OF DISCOVERER OF PRECIOUS STONES IN ALLUVIAL IN PAYABLE QUANTITIES.

22. A prospector who has made the declaration described in paragraph 9, and who proves to the satisfaction of the Civil Commissioner that he has found precious stones in alluvial in payable quantities has a right to select twenty claims in block at the place where such precious stones have been found upon the proclamation of the place as an alluvial digging, and is given a certificate by the Civil Commissioner that he is entitled to such claims. Upon the granting of the certificate the prospector's right to prospect under his licence within the place to which the certificate refers ceases. These claims must be selected prior to the allotment of any other claims in the diggings, and shall remain free of licence moneys as long as they are held by the discoverer in his own right. The size of a claim in a precious stones alluvial digging is ordinarily thirty feet square, unless another size be fixed by the Governor.

RIGHTS OF AN OWNER FINDING PRECIOUS MINERALS OR PRECIOUS STONES IN PAYABLE QUANTITIES.

23. An owner or lessee as described in paragraph 6, of private property or a lessee of Crown land, who has made a declaration that he has found precious minerals or precious stones on his property, and has proved to the satisfaction of the Civil Commissioner that he has found them in payable quantities, is entitled to the same rights as a licenced prospector would be who made such discovery as described in paragraphs 1 to 13, 15 to 17, 19 to 22.

RIGHTS OF AN OWNER ON WHOSE PROPERTY A MINERAL REEF DIGGING HAS BEEN PROCLAIMED.

24. An owner or lessee, as described in paragraph 6, of private property or a lessee of crown land on which a mineral reef digging or portion thereof is proclaimed is entitled to three-fourths of the licence money (£1 per mensem per claim) of each claim in such digging for which he provides a depositing site, not more than an acre in extent, to the satisfaction of the Inspector of the digging. Three months notice in writing must be given to the owner of the property on which it is proposed to proclaim a mineral reef digging. At any time within three months after the declaration mentioned in paragraph 8 has been lodged in regard to minerals discovered on private property the owner is entitled to claim and demand from the Government a mining lease of a proportion, which he may select, but not exceeding one-tenth, of the whole extent of such property held by one title deed. The period of the lease shall be not less than two years nor more than five with the right, at the option of the lessee, to renew the lease, or any renewal thereof for any period not exceeding five years at an annual rent of two shillings per morgen (a morgen 2.116541 acres) in respect of the area leased, payable in advance. The area leased must not include discoverer's claims, as described in paragraph 11, but the owner has the right to require the discoverer forthwith to select the claims to which he is entitled so that the owner may define the ground to be included in his mining lease. The area leased must be bounded by not more than four straight lines, one of the boundaries of the property being for the purpose taken to be one straight line. In measuring the extent of the ground leased the reef may not be taken lengthwise only but the proportion of breadth to length shall be at the highest as one to two. The angles and sides of the lease ground must be indicated by stone beacons of masonry four feet high which must bear the inscription "Mining Lease No. . . ." whilst the sides must be indicated by beacons of masonry not less than three feet above ground and not more than one thousand yards apart. If the leased area is not worked, the lease will not be renewed except

with the written consent of the Government, and if the consent be refused the ground on being proclaimed a mineral reef digging, if not already so proclaimed, may be pegged out as claims. If the owner or lessee as described in paragraph 6, is the discoverer of precious minerals in reef on his property he is entitled to discoverer's claims, as described in paragraphs 11, 12 and 13 in addition to the mining lease mentioned above.

RIGHTS OF AN OWNER ON WHOSE PROPERTY A MINERAL ALLUVIAL DIGGING HAS BEEN PROCLAIMED.

25. An owner or lessee as described in paragraph 6, of private property or lessee of crown land on which a mineral alluvial digging is proclaimed is entitled to one-half the licence money collected by the Government in respect of such digging (claim licence in a mineral alluvial digging on private property is five shillings a claim a month, payable in advance:) he is also entitled to select thirty claims on payment of the licence money one month in advance. These thirty claims are to be selected after the claims to which a discoverer is entitled, as described in paragraph 16 and 17, have been selected. If an owner or lessee as described in paragraph 6, is the discoverer of precious minerals in alluvial on his property he is entitled also to discoverer's claims as described in paragraphs 16 and 17. Three months' notice in writing must be given to the owner of the property on which it is proposed to proclaim a mineral alluvial digging.

RIGHTS OF AN OWNER ON WHOSE PROPERTY A PRECIOUS STONES MINE HAS BEEN PROCLAIMED.

26. An owner or lessee as described in paragraph 6, of private property or a lessee of crown land on which a precious stones mine or portion of a mine has been proclaimed is entitled to select fifty claims thereon next after the discoverer's claims, as described in paragraphs 20 and 21, have been selected on payment of the licence moneys thereon one month in advance, he is also entitled to three-fourths of the licence money in respect to each claim in such mine for which he provides a depositing site, not more than one acre in extent to the satisfaction of the Inspector of the mine (claim licence in a precious stones mine on private property is £1 a claim a month). Three months notice in writing must be given to the owner or lessee as described in paragraph 6 on which it is proposed to proclaim a precious stones mine. If the owner of the property is also the discoverer he is also entitled to discoverer's claim as described in paragraphs 20 and 21.

RIGHTS OF AN OWNER ON WHOSE PROPERTY A PRECIOUS STONES ALLUVIAL DIGGING HAS BEEN PROCLAIMED.

27. An owner or lessee as described in paragraph 6, of private property or a lessee of crown land on whose property a precious

stones alluvial digging or portion of a digging has been proclaimed is entitled to select fifty claims thereon next after the discoverer's claims as described in paragraph 22 have been selected, on payment of the licence moneys thereon one month in advance: he is also entitled to one-half the licence moneys for each claim in such digging. (Claim licence in a precious stones alluvial digging on private property is ten shillings a claim a month unless otherwise fixed by the Governor.) If the owner of the property is also the discoverer he is also entitled to discoverer's claims as described in paragraph 22. Three months notice in writing must be given to the owner of the property on which it is proposed to proclaim a precious stones alluvial digging.

MINERAL LAND LEASING ACTS (NOS. 9 OF 1877 AND 15 OF 1883.)

28. These Acts refer to other than Precious Minerals (*i.e.* gold, silver and platinum) or Precious Stones and apply only to Crown Land. There is no provision in the Acts Nos. 9 of 1877 or 15 of 1883 for the issue of prospecting licences as in the case of the Precious Minerals and Precious Stones Acts. Pending the passing of amending legislation it has been the practice to grant permits to persons who wish to prospect for base minerals on crown land.

PROSPECTING FOR BASE MINERALS ON CROWN LAND.

29. Anyone intending to prospect for base minerals on crown land should apply in writing to the Civil Commissioner of the Division or Resident Magistrate of the District as the case may be in which he proposes to prospect, and furnish a description of the area in respect to which permission is sought, accompanied, if possible, by a sketch of the locality. Enquiry is then made into the matter and should the application be entertained a permit is issued in the form given in paragraph 32. No charge is made for this permit, nor is there any hard and fast rule as to the period for which it may be held, though it has been customary to fix six months as such period towards the end of which time application for renewal for a further period of say six months may be made, the granting or withholding of such renewal being optional with the Government and dependent upon the circumstances of each case, such as the amount of the prospecting work done under the permit, the manner in which operations have been carried out, the expenditure incurred and so on. The area in which prospecting for base minerals may be carried out under this permit may be any shape, but must not exceed a maximum of one square mile in extent. The area moreover must be properly beaconsed by the permit holder. The discovery of base minerals by the permit holder does not give him the right to demand a lease of the area in which he has found them nor does the permit necessarily imply that such lease will be granted. It may be generally assumed,

however, that unless there are, in the opinion of the Government reasonable objections to the contrary, such lease would be granted.

APPLICATION FOR A BASE MINERALS LEASE.

30. Should anyone wish to obtain a base minerals lease he should apply to the Civil Commissioner of the Division or Resident Magistrate of the District as the case may be, in which the land required is situated, describing the area and forwarding a sketch of the locality. If, as the result of enquiry, the application be entertained, the applicant must furnish the Surveyor General, Cape Town, with diagrams in triplicate, framed by a sworn Land Surveyor, shewing the position and extent of the land whereupon a lease will be issued on the conditions given in paragraph 31 and further subject to such special conditions as may be found necessary to impose. It will be seen that a ground rent has to be paid as well as a royalty, which in the case of coal has been fixed at 6d. per ton, a ton, for the purpose of the lease, being reckoned as being 2,352 lbs. The royalties at present fixed per ton, as above, upon base minerals are as follows:—

Asbestos, one shilling; Coal, sixpence; Copper, two shillings and sixpence; Crocidolite, one shilling; Galena sixpence; Gypsum, one shilling; Manganese, sixpence; Petroleum, sixpence per ton of ore yielding not more than 50 gallons of Petroleum per ton of 2,352 lbs. and a proportionate higher royalty on ore yielding over 50 gallons of Petroleum per ton; Salt, one shilling.

CONDITIONS OF LEASE OF CROWN LAND FOR WORKING BASE MINERALS.

31. The Lessee shall be bound to pay an annual ground rent of Five Shillings per morgen for every morgen of land comprised in this Lease and shall also be bound to pay the sum fixed by the Governor, with the advice of the Executive Council, of which notice has been given by Government Notice No. 633, dated 17th September, 1900, in the Government Gazette, viz.: Sixpence (6d.) upon or for every ton of coal, and not exceeding Ten Shillings (10s.) upon and for every ton of any mineral or ore other than coal, raised from the land comprised in this Lease; (see preceding paragraph) and for the purpose of this Lease a ton shall be taken to mean 2,352lbs. in weight. 2. The payments aforesaid shall be made to the Civil Commissioner of the Division in which the Land is situated, or to such other person as the Governor shall from time to time nominate and appoint. 3. The Lessee shall be bound to keep a book or books, in which shall be daily entered, the true quantity of ore, mineral or coal, raised from the land hereby leased, and all such books shall be open to inspection by the Civil Commissioner of the Division, or any person authorised by him, in writing, to inspect the same at all reasonable

times. And if the Lessee shall not keep or cause to be kept, such a book or books as aforesaid, or shall fail to enter or caused to be entered therein daily the quantity of ore, mineral, or coal raised as aforesaid, or shall refuse to allow inspection of any such book or books as aforesaid, he shall be liable to a penalty not exceeding £100, or to imprisonment with or without hard labour, for a period not exceeding six months. 4. The Lessee shall be bound within fourteen days after the expiration of each year of this Lease, to make, before a Resident Magistrate or Justice of the Peace, a solemn declaration in the form as near as may be in the * Schedule annexed to the said Act No. 9 of 1877, stating the true quantity of ore, mineral, or coal raised from the land comprised in the Lease during the then expired year of this Lease; and every person who shall make such a declaration knowing the same to be untrue in any material particular, shall upon conviction, be liable to be imprisoned with or without hard labour for not exceeding twelve months, or to a fine not exceeding £100. 5. The Lessee may, with the consent of the Governor (which consent will not be given unless all Lease Rent due shall have been paid), signified by any writing under the hand of the Surveyor General, assign his Lease, or sublet the land contained therein. 6. If, at the expiration of the first and of each succeeding term of three years during the continuance of this Lease, there shall not have been raised from the land comprised in this Lease during the three years which shall have last expired, a quantity of ore, mineral, or coal of not less than fifty tons, the Governor shall have the right, should it appear fit and proper to do so, with the advice of the Executive Council, to cancel the Lease, and resume the land comprised in it: Provided that it shall not be competent for the Governor to claim such redemption later than three months next after the expiration of the term of three years, during which term the quantity of ore, mineral or coal raised as aforesaid shall not have been fifty tons. Provided also that as often as the Lessee shall satisfy the Governor that the land comprised in the Lease has been, is being, or is about to be worked in a fair *bona fide* manner, then such land shall not be resumed under the provisions of this clause. 7. The Lessee shall not be entitled to carry any

* SCHEDULE TO ACT No. 9 OF 1877.

Ido solemnly and sincerely declare that the quantity of ore raised from the land situate atleased by me under the "Minerals Lands Leasing Act, 1877," during the year of my lease recently expired, is.....tons and no more; and I make this solemn declaration conscientiously believing the same to be true, and by virtue of the eighth Section of the said "Minerals Lands Leasing Act, 1877."

(Signed).....

Declared before me at.....this.....day of.....
190..

(Signed),Resident Magistrate, or Justice of the Peace.

mine or excavation, either above ground or underground made in or at the land comprised in this Lease beyond the limits of the said land: and the Civil Commissioner of the Division, and any person authorised by him in writing, shall be at all times entitled to visit the land comprised in this Lease, and to inspect the works there carried on. 8. This Lease shall not convey to the Lessee any right or title to any gold, silver, or platinum, or to any precious stones, which may be found in or on the land comprised in this Lease. 9. The Lessee shall have the right of renewing this Lease for a further term of.....years dating from the date of expiry of the present term of.....years, such renewal to be notified by the endorsement on the Lease deed to be given under the hand of the Surveyor General.

[NOTE.—The total period including renewals for which a lease may be held is 99 years].

32. FORM OF PERMIT TO PROSPECT ON CROWN LANDS FOR MINERALS OTHER THAN GOLD, SILVER, OR PLATINUM OR PRECIOUS STONES.

Permission is hereby given to.... to enter upon the Crown Lands hereunder described viz.:—for the purpose of searching and prospecting for minerals other than Gold, Silver, or Platinum or Precious Stones.

This Permission shall be in force for.....calendar months from the date hereof, and shall be subject to the following conditions, that is to say:—1. That the area selected for prospecting operations shall be properly beaconed or pegged out by the Prospector and shall not exceed a maximum of one square mile in extent. 2. That if the land or any of it, be held on lease, the consent of the lessee shall first be obtained. 3. That the Prospector is liable for the repair of surface damage occasioned in the course of his operations. 4. That he has no right to the removal of a larger quantity of any mineral soil, ore or rock discovered than is required for testing purposes. 5. That he has an exclusive right only over the area actually beaconed or pegged out. 6. In the event of the discovery of Gold, Silver, Platinum, or any Minerals or Precious Stones, the Prospector shall forthwith make a report thereof to the Civil Commissioner of the Division in which is situated the ground upon which the discovery is made. 7. That the granting of this permit does not necessarily imply that a lease of the area will be granted. 8. That not more than one area shall be beaconed or pegged out at any time under this permit. 9. That the Prospector shall not interfere with native kraals and cultivated lands. 10. That before working in any Native Location, the Prospector shall first apply to the Resident Magistrate of the District in order that such steps as may be deemed expedient shall be taken to explain to the Headmen and people of such Location the nature of the proposed operations.....Surveyor General.

33. A reward of £500 is payable by the Government to the discoverer of coal within the Colony under the following conditions, viz.:—A reward depending in amount upon the value of the discovery, but in no case exceeding £500, will be paid out of the Public Treasury, to the person or persons who shall prove to the satisfaction of the Government the existence in this Colony, in addition to such mines as may be already known, of good serviceable House Coal, having a seam of not less than two feet in thickness, solid and without partings or “foul” from the presence of shale; the ash not to exceed 12 per cent.; the Coal to extend over a superficial area of not less than five acres and to be capable from its position and situation of being worked at a fairly remunerative rate.

34. SUGGESTED FORM OF DECLARATION. (*Precious Minerals Act*)

I (1) of (2)
do solemnly declare in terms of Section 13 of Act No. 31 of 1898, that, while
prospecting under Prospecting Licence No dated
issued by the Civil Commissioner of I have found Minerals in
(3) in payable quantities at (4)
And I make this solemn declaration conscientiously believing the same to be true.

Declared this day of 19.. at.....
Signature.....

Signature of Witness.....

(1) Name in full. (2) Address. (3) Alluvial or Reef as the case may be. (4)
Describe place of discovery, giving name of farm, division, distance from nearest town
or village.

35. SUGGESTED FORM OF DECLARATION. (*Precious Stones Act*).

I (1) of (2)
do solemnly declare in terms of Section 11 of Act No. 11 of 1899, that, while
prospecting under Prospecting Licence No dated
issued by the Civil Commissioner of I have found Precious
Stones, viz. (3) (4)
And I make this solemn declaration conscientiously believing the same to be true.

Declared this day of 190.. at.....
Signature.....

Signature of Witness.....

(1) Name in full. (2) Address. (3) Give number, weight and value of Precious
Stones found, also amount of ground measured in loads of sixteen cubic feet to each
load which has yielded these stones. (4) Describe place of discovery, giving name of
farm, division, distance from nearest town or village.

36. SECOND SCHEDULE. (*Precious Minerals Act No 31 of 1898*).

PROSPECTING LICENCE.

Civil Commissioner's Office,
.....

Whereas A. B. has duly complied with the provisions of Act.
Licence is hereby granted to him to search and prospect for precious minerals
throughout the Colony, for the period of from
to.....

.....
Civil Commissioner.

NOTE.—This licence does not give any right to prospect on private property,
without the consent of the owner; nor on Crown land held under lease without the
consent of the lessee; nor within the prospecting area of any other prospector without
his consent: nor within two hundred yards of any house or building occupied or used
by the owner or lessee thereof; nor on any land under cultivation or required for the
purposes of irrigation: nor in any public squares, streets, roads, railways or
cemeteries, nor in any mine or digging duly declared abandoned; nor in any duly
proclaimed area used for mining purposes.

37. SECOND SCHEDULE. (*Precious Stones Act No. 11, of 1899.*)

PROSPECTING LICENCE

Civil Commissioner's Office,
.....

Whereas A.B. has duly complied with the provisions of Act.....
licence is hereby granted to him to search and prospect for Minerals throughout the
Colony for the period of from to.....

.....
Civil Commissioner.

NOTE.—This licence does not give any right to prospect on private property with-
out the consent of the owner; nor on land held under lease from the Crown without
the consent of the lessee; nor within the prospecting area of any licensed prospector
without his consent; nor within two hundred yards of any house or building occupied or
used by the owner or lessee thereof without his consent; nor on any land under culti-

vation or required for the purpose of irrigation; nor in any public squares, streets, roads, railways or cemeteries; nor in any mines or diggings duly declared abandoned; nor in any proclaimed mining area, actually used for mining purposes: nor in any claim in an alluvial digging.

38 LEASE OF TRACT OR AREA OF ALLUVIAL DEPOSIT OF PRECIOUS MINERALS ON CROWN LAND.

Applications for lease of any tract or area of alluvial deposit on crown land, in which it shall have been shewn to the satisfaction of the Governor that minerals occur and which has not been proclaimed a digging, must be made in writing to the Inspector of the District, or officer acting as such, and every such application must state in full the Christian name or names, surname and address of the applicant, and be accompanied by a sketch plan shewing the approximate area and the position of the ground applied for, together with a deposit of Fifteen Pounds (£15).

The Inspector or Officer acting as such, on receiving any such application and deposit, shall cause a notice with full particulars of the same to be posted at his office and to be published in one or more newspapers circulating in the District notifying that any other applications for lease of the same ground will be received within a date not less than seven days from the date of the first publication of the notice.

If after the publication of such notice, application shall not be made to the Inspector, or officer acting as such, on or before the date so specified, from ten or more duly qualified miners for mining claims within such tract or area applied for, and if no other application for such lease shall be received on or before such date, then the original applicant shall, upon finding two good and approved sureties who shall bind themselves jointly and severally for the due and punctual fulfilment of the conditions thereof, and after paying all survey and other expenses, if any, incurred in excess of the deposit made by him, receive a lease of the tract or area applied for, on the terms set forth in Section 55, as applied by Section 99 of Act No. 31 of 1898, viz.:—

- (a) The lease shall be for a term of two years with a right of renewal from time to time at the option of the lessee for the same period.
- (b) The lease shall be granted solely for the purpose of mining for precious minerals.
- (c) The Lessee shall be bound, during the term of his lease, to carry on mining operations to the satisfaction of the Inspector, or officer acting as such, due regard being had to the special circumstances of each case.
- (d) The Lessee shall have power to sub-let or assign, subject to the approval of the Governor, and any such sub-lease or assignment shall be registered in the Office of the Registrar of Deeds.

- (e) The Lessee shall keep proper books, in which shall be entered the quantity of minerals realized from the land leased, and all such books shall be open to the inspection of the Civil Commissioner of the Division, or other person duly appointed at all reasonable times.
- (f) The Lessee shall be entitled to occupy a sufficient area for depositing sites for machinery or other mining purposes beyond the margin of the area leased, and in the case of such additional area being situate on private property, the owner of such property shall be entitled to receive from the Lessee by way of compensation for the ground required for such depositing sites for machinery or other mining purposes as aforesaid, such sum as may be determined by mutual agreement or by arbitration in the manner provided by the "Lands and Arbitration Clauses Act No. 6 of 1882."

The lease shall further be subject to such special conditions as the Governor may see fit to impose.

In the event of other applications for the lease of the same alluvial tract or area, being received before expiry of the time specified in the notice, and in the event of there not being the required minimum number of applications for mining claims it shall be the duty of the Inspector, or Officer acting as such, to give reasonable notice to such applicants and to the original applicant of the time and place when and where they shall attend, either in person or by an agent, duly authorised in writing to that effect, for the purpose of deciding upon the applications so received.

At the time and place appointed by the Inspector, or Officer acting as such, the lease as applied for, shall be by him submitted to auction between the several applicants, who shall have made application in terms of these regulations before the date specified in the notice referred to in the regulations, and the lease shall thereupon be adjudged to the highest bidder amongst the applicants, who shall have furnished two good and approved sureties in terms of these regulations.

The upset terms on which such Crown land adjoining such digging, as applied for, shall be offered, shall be a ground rent per morgen per month as may be fixed by the Governor, payable half-yearly in advance, and a royalty of one per centum on the gross amount realized by the sale of minerals yielded by the property leased, to be paid from time to time as the same are sold; and the bidding at the auction shall be on the royalty aforesaid and not on the ground rent reserved.

39 LEASE OF TRACT OR AREA OF ALLUVIAL DEPOSIT OF PRECIOUS STONES ON CROWN LAND.

Applications for lease of any tract or area of alluvial deposit on crown land not adjoining an abandoned alluvial digging or

mine, or any abandoned part thereof, in which it shall have been shewn to the satisfaction of the Governor that precious stones occur, and which has not been proclaimed a digging or mine, must be made in writing to the Inspector of the District, or Officer acting as such, and every such application must state in full the Christian name or names, surname, and address of the applicant, and be accompanied by a sketch plan shewing the approximate area and the position of the ground applied for, together with a deposit of Fifteen Pounds (£15).

The Inspector, or Officer acting as such, on receiving any such application and deposit, shall cause a notice with full particulars of the same to be posted at his Office, and to be published in one or more newspapers circulating in the District, notifying that applications from duly qualified miners for mining claims in the areas described in the notice will be received within a date not less than seven days from the date of the first publication of the notice.

If, after the publication of such notice, application shall not be made to the Inspector, or Officer acting as such, on or before the date so specified, from ten or more duly qualified miners for mining claims within such tract or area applied for, on or before such date, then the original applicant shall, upon finding two good and approved Sureties, who shall bind themselves jointly and severally for the due and punctual fulfilment of the conditions thereof, and after paying all survey and other expenses, if any, incurred in excess of the deposit made by him, receive a lease of the tract or area applied for, on the terms set forth in Section 106 of Act No. 11 of 1899, viz. :—

- (a) The lease shall be for a term of two years, with a right of renewal from time to time, at the option of the Lessee for the same period.
- (b) The lease shall be granted solely for the purpose of mining for precious stones.
- (c) The Lessee shall be bound, during the term of his lease, to carry on mining operations to the satisfaction of the Inspector, or Officer acting as such, due regard being had to the special circumstances of each case.
- (d) The Lessee shall have power to sub-let or assign, subject to the approval of the Governor, and any such sub-lease or assignment shall be registered in the Office of the Registrar of Deeds.
- (e) The Lessee shall keep proper books, in which shall be entered the quantity of minerals realised from the land leased, and all such books shall be open to the inspection of the Civil Commissioner of the Division, or other person duly appointed, at all reasonable times.
- (f) The lease rent shall be a ground rent per morgen per month as may be fixed by the Governor, payable half-yearly in advance, and a royalty of one per centum on the

gross amount realised by the sale of precious stones yielded by the property leased, to be paid from time to time as the same are sold.

The lease shall further be subject to such special conditions as the Governor may see fit to impose.

40. LEASE OF ABANDONED ALLUVIAL DIGGING OR REEF DIGGING OR ADJOINING CROWN LAND.—PRECIOUS MINERALS.

Every application for the lease of the whole or any part of any abandoned alluvial or reef digging, or any crown land adjoining such digging, must be made in writing to the Inspector of the District or Officer acting as such, in which such alluvial or reef digging, or crown land adjoining such digging is situate.

Every such application must state in full the Christian name or names, surname and address of the applicant, and be accompanied by a sketch plan shewing the approximate area and position of the ground applied for, together with a deposit of Fifteen Pounds (£15), which amount shall be returned to any successful applicant.

On receiving any such application and deposit the Inspector, or Officer acting as such, shall cause a notice with full particulars of the same to be posted at his office and to be published in one or more newspapers circulating in the district, notifying that any other applications for lease of the same ground will be received within a date not less than seven days from the date of the first publication of the notice.

In the event of no other application being received before the date so specified, the applicant shall, upon finding two good and approved Sureties, who shall bind themselves jointly and severally for the due and punctual fulfilment of the conditions thereof, be entitled to a lease of the abandoned alluvial or reef digging, or any portion of such digging, or any crown land adjoining such digging, as applied for, and he shall receive such lease after payment of all survey and other expenses, if any, incurred in excess of the deposit made by him, as prescribed in the second section hereof, on the terms set forth in sections 55 and 97 of Act No. 31 of 1898, viz.:—

- (a) The lease shall be for a term of two years in the case of an abandoned reef digging, or portion of such digging, or any crown land adjoining such digging, with a right of renewal from time to time at the option of the Lessee for the same period: and for a term of one year in the case of an abandoned alluvial digging, or portion of such digging, or any crown land adjoining such digging, with a right of renewal from time to time at the option of the Lessee for the same period.
- (b) The lease shall be granted solely for the purpose of mining for precious minerals.
- (c) The Lessee shall be bound, during the term of his lease, to carry on mining operations to the satisfaction of the

Inspector, or Officer acting as such, due regard being had to the special circumstances of each case.

- (d) The Lessee shall have power to sub-let or assign, subject to the approval of the Governor, and any such sub-lease or assignment shall be registered in the office of the Registrar of Deeds.
- (e) The Lessee shall keep proper books, in which shall be the entered quantity of minerals realized from the land leased, and all such books shall be open to the inspection of the Civil Commissioner of the Division, or other person duly appointed, at all reasonable times.
- (f) In respect of a lease for the purpose of reef digging, the Lessee shall be entitled to occupy a sufficient area for depositing sites for machinery or other mining purposes beyond the margin of the digging proper, and in the case of any abandoned reef digging being situate on private property, the owner of such property shall be entitled to receive from the lessee by way of compensation for the ground required or leased with such abandoned reef digging as aforesaid, such sum as may be determined by mutual agreement or by arbitration in manner provided by the "Lands and Arbitration Clauses Act, No. 6 of 1882."

The lease shall further be subject to such special conditions as the Governor may see fit to impose.

In the event of other applications being received on or before the date specified in the notice referred to above, it shall be the duty of the Inspector, or Officer acting as such, to give reasonable notice to such applicants and to the original applicant of the time and place when and where they shall attend, either in person or by an agent, duly authorised in writing to that effect, for the purpose of deciding upon the applications so received.

At the time and place appointed by the Inspector, or Officer acting as such, the lease as applied for shall be by him submitted to auction between the several applicants, who shall have made application as above, before the date specified in the notice referred to, and the lease shall thereupon be adjudged to the highest bidder amongst the applicants, who shall have furnished two good and approved Sureties.

The upset terms on which such abandoned alluvial or reef digging, or any portion thereof, or such crown land adjoining such digging, as applied for, shall be offered, shall be a ground rent per morgen per month as may be fixed by the Governor, payable half-yearly in advance, and a royalty of one per centum on the gross amount realized by the sale of minerals yielded by the property leased, to be paid from time to time as the same are sold; and the bidding at the auction shall be on the royalty and not on the ground rent reserved.

41. LEASE OF ABANDONED ALLUVIAL DIGGING OR MINE OR ADJOINING CROWN LAND.—PRECIOUS STONES.

Applications for the lease of the whole or any part of any abandoned alluvial digging or mine, or any abandoned part of an alluvial digging or mine, or any portion thereof, or any crown land adjoining such digging or mine, must be made in writing to the Inspector of the District or Officer acting as such in which such alluvial digging or mine or crown land adjoining such digging or mine is situate.

Every such application must state in full the Christian name or names, surname and address of the applicant, and be accompanied by a sketch plan shewing the approximate area and position of the ground applied for, together with a deposit of Fifteen Pounds (£15), which amount shall be returned to any unsuccessful applicant.

On receiving any such application and deposit, the Inspector, or Officer acting as such, shall cause a notice with full particulars of the same to be posted at his office and to be published in one or more newspapers circulating in the District, notifying that any other applications for lease of the same ground will be received within a date not less than seven days from the date of the first publication of the notice.

In the event of no other application being received before the date so specified, the applicant shall, upon finding two good and approved Sureties, who shall bind themselves jointly and severally for the due and punctual fulfilment of the conditions thereof, be entitled to a lease of the abandoned alluvial digging or mine, or any portion of such digging or mine, or any crown land adjoining such digging or mine, as applied for, and he shall receive such lease after payment of all survey and other expenses, if any, incurred in excess of the deposit made by him, as prescribed in the second section hereof, on the terms set forth in Sections 44 and 107 of Act No. 11 of 1899, viz:—

- (a) The lease shall be for a term of two years in the case of an abandoned mine or any abandoned part of a mine, or any portion of either, or any crown land adjoining such mine, with a right of renewal from time to time, at the option of the Lessee, for the same period; and for a term of one year in the case of an abandoned alluvial digging or any abandoned part of an alluvial digging, or any portion of either, or any crown land adjoining such digging, with a right of renewal from time to time, at the option of the Lessee, for the same period.
- (b) The lease shall be granted solely for the purpose of mining for precious stones.
- (c) The Lessee shall be bound, during the term of his lease, to carry on mining operations to the satisfaction of the

- Inspector, or Officer acting as such, due regard being had to the special circumstances of each case.
- (d) The Lessee shall have power to sublet or assign, subject to the approval of the Governor, and any such sub-lease or assignment shall be registered in the Office of the Registrar of Deeds.
 - (e) In the case of an extension or expansion of an abandoned mine or of an abandoned portion of a mine being discovered by the Lessee thereof, he shall be entitled to have the same included on his lease, on payment of an extra rent per morgen, or part of a morgen, in proportion to the rent paid for the ground in the original lease.
 - (f) The Lessee shall keep proper books, in which shall be entered the quantity of precious stones realised from the land leased, and all such books shall be open to the inspection of the Civil Commissioner of the Division, or other person duly appointed, at all reasonable times.
 - (g) In respect of a lease of an abandoned mine or any abandoned part of a mine, or any portion of either, or of crown land adjoining such mine, the Lessee shall be entitled to occupy a sufficient area for depositing sites for machinery or other mining purposes beyond the margin of the mine proper, and in the case of any abandoned mine or any abandoned portion of a mine being situate on private property, the owner of such property shall be entitled to receive from the Lessee, by way of compensation for the ground required or leased with such abandoned mine or abandoned portion thereof as aforesaid, such sum as may be determined by mutual agreement or by arbitration, in manner provided by the "Lands and Arbitration Clauses Act No. 6 of 1882."

The lease shall further be subject to such special conditions as the Governor may see fit to impose.

In the event of other applications being received on or before the date specified in the notice referred to above it shall be the duty of the Inspector, or Officer acting as such, to give reasonable notice to such applicants and to the original applicant of the time and place when and where they shall attend either in person or by an Agent duly authorised in writing to that effect, for the purpose of deciding upon the applications so received.

At the time and place appointed by the Inspector, or Officer acting as such, the lease as applied for, shall be by him submitted to auction between the several applicants, who shall have made application as above, before the date specified in the notice referred to and the said lease shall thereupon be adjudged to the highest bidder amongst the applicants aforesaid, who shall have furnished two good and approved Sureties.

The upset terms on which such abandoned mine or abandoned alluvial digging, or any abandoned part of any alluvial digging or mine, or any portion thereof, or such crown land adjoining such digging or mine, as applied for, shall be offered, shall be a ground rent per morgen per month as may be fixed by the Governor, payable half-yearly in advance, and a royalty of one per centum on the gross amount realised by the sale of precious stones yielded by the property leased, to be paid from time to time as the same are sold; and the bidding at the auction shall be on the royalty and not on the ground rent reserved.

WINE SHOW.

LIST OF AWARDS.

The following is the list of awards (subject to analysis proving satisfactory) made in connection with the show of dark, sweet, and white wines and brandies, held under the auspices of the Board of Horticulture :—

BEST TEN LEAGUERS WINE OF THE HOCK TYPE, light white wines.—P. and P. Rabie (Nuy), 1; W. A. Krige (Stellenbosch), 2; C. M. Neethling (Stellenbosch), 3.

BEST TEN LEAGUERS WINE OF SAUTERNE TYPE.—E. J. Forster (Lyndoch), 1; J. F. du Toit (Vlottenberg), 2; T. J. de Waal (Stellenbosch), 3.

BEST TEN LEAGUERS WINE, SHERRY TYPE.—H. Joubert (Vlottenberg), 1; W. A. Krige (Stellenbosch), 2; T. J. de Waal (Stellenbosch), 3.

BEST FIVE LEAGUERS SWEETISH WHITE WINE.—No prizes awarded.

BEST FIVE LEAGUERS SWEET WHITE WINE.—D. M. le Roux (Paarl), 1.

BEST TEN LEAGUERS WINE, CLARET TYPE.—F. P. Versfeld (Constantia), 1; High Constantia Estate, 2; Henry Cloete (Alphen, Wynberg), 3.

BEST TEN LEAGUERS OF WINE, BURGUNDY TYPE.—L. Cloete (Glen Dirk, Wynberg), 1; E. Lange (Nooitgedacht, Koelenhof), 2; R. W. Boyes (Mulder's Vlei), 3.

BEST FIVE LEAGUERS HEAVY DRY RED WINE.—G. A. Retief (Vredenburg, Lower Paarl), 1; P. and P. Rabie (Nuy), 2; H. Cloete (Alphen, Wynberg), 3.

BEST FIVE LEAGUERS HEAVY SWEETISH RED WINE, Sweet Port Type.—D. M. le Roux (Paarl), 1; A. P. Burger (Nuy), 2.

BEST FIVE LEAGUERS SWEET RED WINE.—D. M. le Roux (Paarl), 1; F. and D. Hugo (Glenoak, P.O., Nuy), 2; A. P. Burger (Nuy), 4.

WINE BRANDY.—No award.

DOP BRANDY.—James Malan (Constantia), 1.

BEST TEN LEAGUERS LIGHT WHITE WINE.—P. and P. Rabie (Nuy), silver cup, presented by Mr. J. W. Jagger, M.L.A.

BEST TEN LEAGUERS LIGHT RED WINE.—F. F. Versfeld (Constantia), silver cup, presented by Mr. J. W. Jagger, M.L.A.

In Class 1 (Light Wines), the judges, in their report, stated that the exhibits generally were of low grade, except the winners, which samples were exceptionally good. In Class 6 (Claret Type) they noted a decided improvement. Generally they recommended that wines should be exhibited under the name of the grapes from which they were made; and suggested that an amended prize list for future shows should be framed by the Western Province Horticultural Board in consultation with representatives of the wholesale Cape Wine trade. Competitors should also be limited to one entry in each class.

In the heavy wine classes, the judges stated that in Class 2 (Sauterne type) and Class 3 (Sherry type), owing to the climatic conditions, the quality was not up to the average, and they hoped to see an improvement next season. Class 4 (Burgundy type) was a large one, and the quality shewed an improvement as compared with last year, but there was room for still further improvement. In Class 8, the majority of samples were not of good quality, and the same remark applied to Classes 4, 5, 9, and 10. In Class 12 (Dop brandy), sample 107 was of excellent quality, but the others were not up to the mark. The judges concurred with the general remarks made in the light wine section.

Messrs. F. W. Fanner, F. S. Green, and F. Kuffner were the judges in the light wine, and Messrs. J. A. Gird, H. A. Bam, and A. S. de Villiers in the other section.

The Show was held at the office of the Western Province Agricultural Society, Parker's Buildings, Burg Street, Cape Town.

**Record of Eggs laid by Hens entered for the Western Province
Agricultural Society's Egg Laying Competition.**

Pen No	Breed.	Pullet	Eggs Laid. Sept.	Points	Weight. Oz.	Total per Pen from 18th. June to 30th September, inclusive.	
						Eggs.	Points.
1	Buff Orpingtons	1	(dead)				
		2	21	42	44 ³ / ₄		
		3	23	43	43 ¹ / ₁₆		
		4	22	44	45 ⁷ / ₁₆	139	275
2	Partridge Wyandottes	5	11	15	19 ⁷ / ₁₆		
		6	12	20	22 ³ / ₈		
		7	23	44	43 ³ / ₈		
		8	16	24	28 ¹ / ₂	118	203
3	White Wyandottes	9	10	37	35 ¹ / ₂		
		10	19	38	39 ³ / ₁₆		
		11	23	46	45 ¹ / ₁₆		
		12	17	27	30 ⁹ / ₁₆	225	427
4	White Leghorns ..	13	23	46	43 ¹ / ₈		
		14	20	28	35		
		15	16	32	31 ¹ / ₁₆		
		16	26	49	48 ⁹ / ₁₆	234	404
5	White Wyandottes ..	17	17	34	38 ³ / ₁₆		
		18	18	35	34 ¹ / ₂		
		19	14	28	30 ¹ / ₂		
		20	19	33	34 ⁵ / ₁₆	161	299
6	Buff Orpingtons ..	21	18	36	39 ¹ / ₈		
		22	(dead)				
		23	17	34	33 ¹ / ₁₆		
		24	21	41	43 ⁹ / ₁₆	172	340
7	Plymouth Rocks ..	25	17	26	30 ¹ / ₁₆		
		26	17	17	26 ⁵ / ₈		
		27	16	28	30 ¹ / ₄		
		28	23	37	41 ¹ / ₄	198	312
8	Buff Orpingtons ..	29	17	31	31 ¹ / ₂		
		30	13	25	24 ¹ / ₄		
		31	16	32	33 ⁵ / ₈		
		32	19	37	38 ¹ / ₁₆	110	206
9	Brown Leghorns ..	33	16	31	32 ¹ / ₁₆		
		34	(dead)				
		35	22	44	43 ³ / ₈		
		36	20	37	36 ¹ / ₁₆	179	354
10	Buff Orpingtons ..	37	22	44	45 ⁷ / ₁₆		
		38	16	32	33 ³ / ₈		
		39	22	35	39 ⁹ / ₁₆		
		40	20	40	38 ¹ / ₁₆	179	342
11	White Leghorns ..	41	15	30	29 ¹ / ₁₆		
		42	16	32	32		
		43	5	9	9 ³ / ₁₆		
		44	19	38	38 ³ / ₈	152	298
12	Buff Leghorns ..	45	20	37	36 ⁹ / ₁₆		
		46	15	28	29 ¹ / ₁₆		
		47	20	40	38 ¹ / ₁₆		
		48	(dead)			150	266

Egg Laying Competition.—*continued.*

Pen No.	Breed.	Pullet No.	Eggs laid. Sept.	Points	Weight. (Oz.)	Total per Pen from 18th June to 30th September, inclusive.	
						Eggs.	Points.
13	Buff Orpingtons ..	49	15	30	28 $\frac{1}{2}$ $\frac{1}{16}$	205	395
		50	20	40	40 $\frac{1}{2}$ $\frac{1}{16}$		
		51	13	25	25 $\frac{1}{2}$ $\frac{1}{16}$		
		52	13	23	23 $\frac{1}{2}$ $\frac{1}{16}$		
14	Buff Orpingtons ..	53	17	31	31 $\frac{1}{2}$ $\frac{1}{16}$	197	365
		54	14	22	25 $\frac{1}{2}$ $\frac{1}{16}$		
		55	15	30	30 $\frac{1}{2}$ $\frac{1}{16}$		
		56	12	24	22 $\frac{1}{2}$ $\frac{1}{16}$		
15	White Wyandottes ..	57	20	26	34 $\frac{1}{2}$ $\frac{1}{16}$	103	180
		58	8	16	17 $\frac{1}{2}$		
		59	12	22	23 $\frac{1}{2}$ $\frac{1}{16}$		
		60	2	2	3 $\frac{1}{2}$ $\frac{1}{16}$		
16	Black Orpingtons ..	61	9	18	18 $\frac{1}{2}$	130	259
		62	13	26	27 $\frac{1}{2}$		
		63	15	30	30		
		64	19	38	35 $\frac{1}{2}$		
17	Buff Orpingtons ..	65	19	38	38 $\frac{1}{2}$ $\frac{1}{16}$	99	169
		66	Nil.				
		67	12	13	20 $\frac{1}{2}$		
		68	15	30	31 $\frac{1}{2}$ $\frac{1}{16}$		
18	White Leghorns ..	69	14	27	26 $\frac{1}{2}$ $\frac{1}{16}$	204	375
		70	23	46	45 $\frac{1}{2}$		
		71	18	36	37 $\frac{1}{2}$ $\frac{1}{16}$		
		72	23	46	45 $\frac{1}{2}$		
19	Brown Leghorns ..	73	19	37	36 $\frac{1}{2}$ $\frac{1}{16}$	189	311
		74	17	34	32 $\frac{1}{2}$ $\frac{1}{16}$		
		75	18	19	30		
		76	13	26	26 $\frac{1}{2}$		
20	White Leghorns ..	77	14	28	31 $\frac{1}{2}$	113	217
		78	16	30	31 $\frac{1}{2}$		
		79	7	13	12 $\frac{1}{2}$ $\frac{1}{16}$		
		80	17	31	31 $\frac{1}{2}$ $\frac{1}{16}$		
21	White Leghorns ..	81	9	18	18 $\frac{1}{2}$ $\frac{1}{16}$	61	122
		82	15	30	34 $\frac{1}{2}$ $\frac{1}{16}$		
		83	7	14	15 $\frac{1}{2}$ $\frac{1}{16}$		
		84	17	34	32 $\frac{1}{2}$ $\frac{1}{16}$		
22	Buff Orpingtons ..	85	12	24	24 $\frac{1}{2}$	152	285
		86	15	30	28 $\frac{1}{2}$ $\frac{1}{16}$		
		87	7	11	12 $\frac{1}{2}$ $\frac{1}{16}$		
		88	19	38	34 $\frac{1}{2}$ $\frac{1}{16}$		
23	Buff Orpingtons ..	89	22	39	40 $\frac{1}{2}$ $\frac{1}{16}$	183	356
		90	19	38	38 $\frac{1}{2}$ $\frac{1}{16}$		
		91	16	27	29 $\frac{1}{2}$		
		92	4	8	8 $\frac{1}{2}$ $\frac{1}{16}$		
24	Plymouth Rocks ..	93	19	30	33 $\frac{1}{2}$ $\frac{1}{16}$	97	157
		94	17	33	31 $\frac{1}{2}$ $\frac{1}{16}$		
		95	19	21	31 $\frac{1}{2}$ $\frac{1}{16}$		
		96	18	34	33 $\frac{1}{2}$ $\frac{1}{16}$		

In scoring, 2 points are given for every egg weighing over $1\frac{1}{2}$ oz., and 1 point for every egg weighing $1\frac{1}{2}$ oz. or less.

Record from 1st to 24th October, 1906.

Pen No.	Hen No.	Eggs Laid.	Points.	TOTAL PER PEN.		Total per Pen from June 18 to October 24.	
				Eggs.	Points.	Eggs.	Points.
1	1	..	.				
	2	19	38				
	3	12	18				
	4	9	18	40	74	179	349
2	5	8	12				
	6	10	18				
	7	7	13				
	8	8	16	33	59	151	262
3	9	15	30				
	10	16	32				
	11	15	29				
	12	10	18	56	109	281	536
4	13	18	36				
	14	17	21				
	15	16	32				
	16	18	35	69	124	303	528
5	17	15	30				
	18	10	19				
	19	13	26				
	20	15	19	53	94	214	393
6	21	16	32				
	22	..	..		
	23	18	35				
	24	8	16	42	83	214	423
7	25	11	18				
	26	8	8				
	27	10	20				
	28	11	20	40	66	238	378
8	29	12	23				
	30	10	16				
	31	7	14				
	32	8	16	37	69	147	275
9	33	9	18				
	34	..	..		
	35	12	24				
	36	12	23	33	65	212	419
10	37	10	20				
	38	6	11				
	39	11	19				
	40	7	13	34	63	213	405
11	41	12	24				
	42	12	24				
	43	15	28				
	44	19	38	58	114	210	412
12	45	18	35				
	46	14	28				
	47	17	34				
	48	49	97	199	363
13	49	12	23				
	50	10	20				
	51	6	12				
	52	11	22	39	77	244	472

EGG LAYING COMPETITION.

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Record.—continued.

Pen No.	Hen No.	Eggs Laid.	Points.	TOTAL PER PEN.		Total per Pen from June 18 to October 24.	
				Eggs.	Points.	Eggs.	Points.
14	53	10	19				
	54	15	24				
	55	11	22				
	56	8	16				
15	57	13	16	44	81	241	446
	58	13	26				
	59	10	20				
	60	15	17				
16	61	18	36	51	79	154	259
	62	6	12				
	63	11	22				
	64	14	28				
17	65	15	30	49	98	228	357
	66	14	23				
	67	10	10				
	68	12	24				
18	69	15	30	51	87	150	256
	70	9	18				
	71	14	28				
	72	17	34				
19	73	15	30	55	110	259	485
	74	16	32				
	75	16	18				
	76	15	30				
20	77	15	30	62	110	251	421
	78	17	34				
	79	10	17				
	80	19	38				
21	81	10	20	61	119	174	336
	82	15	30				
	83	14	28				
	84	11	21				
22	85	7	14	50	99	111	221
	86	7	11				
	87	12	16				
	88	7	13				
23	89	17	26	33	54	185	339
	90	15	29				
	91	15	29				
	92	1	2				
24	93	11	16	48	86	231	442
	94	5	8	(died	12/10/06)		
	95	19	20				
	96	17	27	52	71	149	228

CORRESPONDENCE.

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith *A nom de plume* may be attached for publication.

Mites in Lucerne.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Under separate cover I am sending you a bottle containing a number of very minute insects. This little pest has attacked a patch of about seven morgen of lucerne, and every square inch of ground seems to be alive with them. They suck all the juice out of the leaves and retard the growth.

Can you suggest any simple remedy for getting rid of them? Do you think irrigating at short intervals will remedy the evil?—Yours. &c.,

A. CADLE.

New Bethesda, Sept. 17.

Mr. C. P. Lounsbury, Government Entomologist, supplies the following memo.:—The specimens were all dead and somewhat decomposed when they reached me, but I am unable to distinguish them from the common Bryobia Mite, *Bryobia pratensis*. Information in regard to this insect as a fruit tree pest was given in the *Agricultural Journal* for August, 1908. We have noticed it in small numbers in lucerne near Cape Town, and last year a report of serious injury to a small patch reached us from Steynsburg. In America, the creature is called the "Clover Mite," and doubtless it is found there on lucerne, as it is known practically all over the country; lucerne and clover, be it understood, are allied plants. But it is not recorded as a pest of any importance to lucerne, and last year an enquiry to the entomologist of Colorado, in which State lucerne is extensively grown, brought a reply to the effect that it was not known to affect lucerne in his area. The fact is mentioned because, from the Cape experience alone, the creature appears capable of giving a good deal of trouble. That it does not in Colorado is hopeful. The climate of the State is dry, lucerne requiring irrigation always, and dryness seems very favourable to the rapid multiplication of the mite. Though to be found in almost every garden around Cape Town, where the climate is a relatively moist one, it never does much injury. It may be inferred from this that irrigation at short intervals, as suggested, will tend to keep down the numbers. I hope that your correspondent will write later and tell us whether the moisture answers or not.

Troublesome Birds and Jackals.

How to Get Rid of Them.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—During the past two Seasons, I have killed over 1,000 (Muis Vogels) by putting Strychnine into ripe figs; and have picked up as many as 50 dead birds at one time under one tree. I have often watched the birds in the tree give 3 or 4 pecks, then a chirp and drop down. If they are not disturbed, very few will drop any great distance away. Choose the figs that have been touched by the birds and with your pocket knife, or a piece of reed cut sharp, put in a few grains of Strychnine. The dead birds I collect and put Strychnine down their throats and drop them about the veld for the jackals and have been very successful—finding dead and dried carcasses of jackals months after.

Hold the bird by the beak, take a straight smooth stick about 6 inches long by $\frac{1}{4}$ inch thick, force this gently down the gullet right to the stomach; withdraw, and dip into bottle containing the poison when a few grains will adhere; put down the throat gently, give, the stick a few twists, and withdraw. The dainty bit is now ready for Mr. Jackal, who is very fond of birds and will sooner take that, than a piece of flesh that has been touched by the hand. Besides there will be no fear of our faithful friend the dog taking the poison.

Hoping others will have the same success.—Yours etc.

G. VAN NIEKERK, JUN.

De Nek, Graaff Reinet,
Sept., 20th, 1906.

Cork, Pepper, and Capers.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—It would be interesting to know whether any of the following Trees, &c., have ever been grown, or attempted in this country:—

(1) *Cork*: Bottle corks in use in the Colony seem to be of a very inferior grade: one would imagine that this valuable product might be successfully grown in some part or other of South Africa.

(2) *Black Pepper*: (*Piper nigrum*?) This is said to grow wild on some of the European coasts of the Mediterranean Sea.

(3) *Capers*: This plant is also said to grow freely in South Europe, and would perhaps be worth growing in gardens.—Yours &c..

HENRY GEARING.

Cape Town, October 10.

(1)—The Forest Department supplies the following:—The Cork Oak (*Quercus suber*) is a native of Southern Europe and Northern Africa.—There are good specimens of this valuable tree growing in the plantations of the Forest Department in the Cape Peninsula and Eastern Province, and no doubt there are other parts of the Cape Colony where it would thrive. After the Cork Oak has attained an age of about twenty years, it may be stripped of its bark every six or seven years, but the best bark is harvested from trees over forty years of age. The mean yield is about 1 lb of bark per tree per annum. England alone imports about £1,000,000 worth of cork from the extensive forests of Algeria, Spain, Portugal and the South of France.

(2) and (3).—We have no information as to either of these plants in South Africa. We cannot imagine them proving of great industrial value in our conditions even though they might be successfully cultivated.

The Shearing Question.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—A great deal has been said about how wool should be got up for market, but little notice has been taken of the actual removal of the fleece from the sheep or goats.

To my mind this is a very important point in the light of the most unsatisfactory and "rough" system at present in force. Of course, I speak of this district, but have little doubt the same trouble exists in many other parts.

During the last seven years good shearing "boys" have become so conspicuous by their absence that farmers—in cases I know of—are at their wits' end to get their sheep shorn,

When one does get "boys," they are in nine cases out of ten bad shearers, and the clip, not to mention the sheep, suffers accordingly.

What it will be a few years hence is not pleasant to contemplate.

A way out of the difficulty could be found if some of the "poor white" class, having the experience, formed a band and purchased hand-power shearing machines. The advantages accruing to the farmer from this course are so obvious that they need not be enumerated. The greatest difficulty I foresee is that the class referred to would, in all likelihood, consider the work beneath them.

If this proved to be the case it would be most unfortunate, as I feel sure there is a good opening for the enterprise.

Personally, I would rather pay as much again as I pay "boys" to have my sheep properly shorn.

I do not know what the experience of others is, but I must say I find coloured labour become more unsatisfactory as years go on.

It might be interesting and instructive to hear the views of others on the subject.
—Yours, etc.,

"PERSEVERE."

Dwaal, Oct. 15.

If this is ever to be a great wool-producing country the shearing question must first be solved.—ED. A.J.

Pines at Maclear.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In your current number I see you have identified a pine tree from cones sent by Mr. Pringle. Under separate cover I send (A) Leaves, buds, and cone of a pine, about 12 feet high measuring 1 foot 10 inches at 3 feet from the ground. (B) Leaves, buds, and flowers of a pine, about 25 feet high measuring 3 feet 11 inches at 3 feet from the ground. These trees are about 11 or 12 years old from seed and A has been much checked by having branches broken off by cattle. They are, I think, the only pine trees over 18 months old within 20 miles and have no other trees to break the winds for them. I will be very much obliged if you can identify them for me as a guide for further planting. These trees are growing at about 6,500 feet above sea level.—Yours, etc.,

Maclear.

LAWRENCE C. FRENCH.

The Forest Department supplied the following reply to above:—The specimen marked A. is *Pinus Pinaster*, and that marked B. is *Pinus Insignis*. Both trees are usually found at rather low elevations near the sea. *Pinus Pinaster*, commonly known as Cluster Pine, is a native of the Mediterranean district of Europe. It is found along the Atlantic shores of France, Spain, and West Portugal, as well as in Algeria and Asia Minor. Though flourishing most frequently on sandy plains, it also extends to a height of 2,800 feet on the Southern slopes of the Central Apennines. The Cluster Pine does not thrive in limey soils or stiff clays. It is otherwise a very accommodating tree. In this Colony it has been planted with success in the South West as well as in the plantations of the Eastern Province. In Natal specimens of Cluster Pine have been tried in almost every district, and thus far with success. *Pinus Insignis*, is found along the coast of California, usually at low elevations and quite near the sea. In America the *Insignis* Pine is of very small value as a timber tree, and is never found in the hot interior. In this country it does fairly well in the Cape Peninsula and is thriving on the Hogsback in Victoria East where mists and rains occur daily during summer. Both these trees afford an illustration which emphasizes the fact that the theory as to where a tree *should* grow is not always an exact indication as to where it *will* grow, until theory has been upheld by actual experiment. This is especially important in South Africa where theory is confronted by so many apparent contradictions. Accordingly the Forest Department makes it a practice of first trying small groups of trees before planting extensively.

Lamziekte in Cattle.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—We are pleased to hear that Dr. Hutcheon intends visiting this country for the purpose of carrying out an investigation in connection with Lamziekte. As we have had losses from the above disease, and have studied it carefully we think it our duty to record our experiences.

During the first six years we farmed on Mount Temple we had not a single case of Lamziekte (at that time we had about 30) cattle, but our neighbours on the south side were losing heavily from it. Their cattle used occasionally to stray to our homestead, and as we were of opinion that the disease was infectious, we used to send the straying cattle back to their owners directly we found them on our ground. One day a lot visited our salt troughs, and we had them placed in our kraal. An hour later when we started them off to their owners, we found that one cow had the Lamziekte too badly

to admit of her moving away. A few days later she died in our cattle kraal, and *within a month Lamziekte made its appearance amongst our cattle*, and we lost several head.

Mr. J. Peach, the former owner of the farm lying on the south-west of Mount Temple informed us that he never had a case of this disease until a trader visited his farm and left one of his oxen suffering from Lamziekte on his farm, and that shortly after his own cattle began to die, having contracted the disease from the trader's ox. We have always contended that the disease is infectious—as infectious as the Redwater, or the Rhodesian Tick Fever—and *that, like the above diseases, it is carried about by the ticks*, and that if we could only manage to “wipe out” the ticks, we should not be bothered any more by the Lamziekte.

What do we base our contentions upon, you ask? We will tell you.

(1) During the winter months, when there are very few ticks about, we very rarely have a case of Lamziekte. It invariably begins just after the first summer rains, when the ticks swarm out of the ground.

(2) If a certain kind of tick attacks the kids of our Boer goats, they, like our cattle, become paralyzed. If we are quick about it and remove the ticks, the kids usually recover.

(3) We have a domesticated Gembok cow here. About six months ago she disappeared. We found her out in the veld down with Lamziekte. We found a large brown tick half buried in a certain part of her body, and there were several smaller ticks near it. We had all removed and in a fortnight the animal could walk about. She has now quite recovered.

Our idea is that bone-meal does good, not (as it is alleged) because it supplies a deficiency of phosphates in the soil, but because it contains some constituent or other which acts as a prophylactic. Surgeon Parke, Dr. Schultz, and other African travellers, tell us that Quinine counteracts the poison of the “fever” mosquito—why should bone-meal not contain some medicine which has the same effect in the case of Lamziekte?

We trust that we shall meet Dr. Hutcheon when he visits this District.

Yours, &c.,

LANHAM BROS.

Mount Temple, Kuruman, September 24.

Measles in Pigs—Another Form.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—A short time ago I killed a large sow, which was very fat, and seemed very well. On opening it the “melt,” liver, and some parts of the flesh between the hind legs were covered with bladder-like blisters, about the size of a dove's egg, and containing water. There was absolutely no sign of measles, and the meat was a good colour. About six weeks before, the pig had a litter of twelve, which all died.

She had been in the sty for about a week, but previously had been running in rape and green oats. The water in these blisters smelt like urine. I was unable to make any use of the pork, not knowing what ailed the pig.

I would be much obliged if you could throw some light on the matter.—Yours, &c.,

Lady Grey, Sept. 20.

FARMER.

The disease affecting these pigs was a form of measles, only not the usual form, but the type which is produced by the tapeworm of the dog. The ordinary measles of pigs is due to their eating the faeces of man containing tapeworms, but in this case it was the tapeworm of the dog. Unless the flesh is very much invaded by the bladder cysts, the flesh is harmless to human beings, and not like that of true measly pork.—J. D. BORTHWICK, C.V.S.

Abortion in Goats.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Can you oblige me with any information regarding the prevention or stopping of abortion in goats. Any information will be welcome.—Yours, &c.,

P. J. POTCHE, JUN.

Aliwal North.

Abortion causes more loss in this Colony than is generally known, and to treat it successfully it must be recognised as an infectious disease, and treated accordingly. When it makes its appearance in a herd of goats, a change of pasture is at once necessary, taking precaution to first remove all those ewes which have aborted; these can be run with the lamels, and the kraals cleansed and disinfected. As regards the ewe which has aborted, her uterus should be washed out with a weak solution of permanganate of potash or Jeyes' Fluid, and all the back parts thoroughly cleaned. After abortion the ewes should be kept away from the ram for three months at least.—J. D. BORTHWICK, C.V.S.

Ringworm in Calves.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—My calves are troubled with bare patches all over their faces, and around their eyes; these extend until the whole face is one mass of scale. This disease is very difficult to get rid of and very infectious. What would be the best remedy.—Yours, &c.,

P. J. VAN BREDÁ.

Struis Bay.

From the description I am of opinion that the calves have ringworm, a vegetable parasitic disease of a highly contagious nature. With regard to treatment, I would advise washing the affected parts well with soft-sap and warm water, using a hard brush so as to get rid of the scales; after washing and allowing to dry, apply a mixture of Stockholm Tar and oil, one part to three parts of sulphur and fat. A good remedy is an ointment made of Biniodide of Mercury, one drachm, and lard four ounces, but this requires to be used carefully and not too large a surface dressed at once. Isolate the infected animals and remove the clean calves to a new kraal.—J. D. BORTHWICK, C.V.S.

Tontelbosch Down.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—By to-day's post I am sending you a small parcel containing the products of a plant which grows well about here. As you will see by investigation it is of a very fine silky nature. The pods containing this stuk, are to be found on bushes from 4 to 5 feet high and vary in numbers of from 40 to 50 on each plant. We should be pleased to know the name of this plant, and if it could be used for commercial purposes?—Yours &c.

R. ULVATH.

Berlin, C.C.

The specimen sent is down from the fruit of *Gomphocarpus fruticosus*, (the Tontelbosch) a herb common all over the Colony. It is questionable if it will have any industrial value as attempts made in the past have come to nothing.—E.A.N.

The Last East London Show.

Prize List Correction.

To the Editor, AGRICULTURAL JOURNAL.

SIR.—The Committee of the East London Agricultural Society having received a report that a mistake had been made in awarding a prize in the class for 4-6 tooth South African bred rams, has made careful enquiry into the matter and finds such an unfortunate error did occur. Although it is now too late to alter the award, the committee feel that in justice to Mr. Pell Edmunds of Ripplemead, Kubusie, whose ram should have received the prize, this explanation should be made public.—I am, &c.

A. E. HASTINGS.

Secretary.

Sands and Grass.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Can you or any of your readers kindly inform me through your valuable pages if there is any grass which will grow in a piece of veld covered with the sand of a watercourse which has been dammed up, and the sand allowed to wash over the above-mentioned piece of veld. All the bushes and grass are dead for as far as the sand is washed.

Can you let me know of any grass which will grow in the sand, and is of good grazing quality to stock, and if so, where any of the seed is obtainable, and further particulars?

Thanking you for your trouble, and also hoping this may be of interest to your readers—Yours, &c,

AMATEUR FARMER.

Stellenbosch, Oct. 18.

It depends largely on the nature of the sand. Marram grass will grow and thrive well in sea sands, and is now used to stop and prevent drifting or "blowing" sands of that nature. But whether it would thrive in the circumstances mentioned by our correspondent, we cannot say. It would cost very little to try, as the seed and young plants with full instructions for handling can be obtained of the Forest Department.

RURAL REPORTS.

For the month ending 15th October, 1906.

Aberdeen.—Weather promising, with light rainfall, and veld in good condition. Cereal suffering somewhat from the effects of drought, and lucerne is just commencing to shoot up. Stock in fairly good condition.

Aliwal North.—Weather windy and cold, with light rainfall. Veld in poor condition. Fruit trees promising. Crop of wheat fair, but below the average. Stock in fair condition.

Barkly West.—Heavy winds, accompanied by immense clouds of dust, and the veld is in rather bad condition. Locusts cause a lot of damage here. Fairly good rains have fallen. The fruit crop has been damaged on most farms by frost and cold winds. Crops of wheat and oats have suffered severely from the drought. Stock doing well, except the young lambs, which are in rather low condition owing to the drought.

Bathurst.—Mild weather, with good rainfall. Fruit trees and vines doing well. Stock in fairly good condition.

Bedford.—Weather moist, with tendency to South-East winds, and appearance of good season following. There have been good rains, and, consequently, the veld is coming on well. Lucerne has benefitted very considerably by the rains, and a good crop is expected to be cut soon. Stock doing well.

Carnarvon.—Average rainfall, and veld in poor condition. Stock doing fairly well.

Cathcart.—Cold weather, with average rainfall. Veld in good condition. Fruit and vines promising. Crop of wheat bad owing to drought. Oats doing well where irrigated. Lucerne also doing fairly well where irrigated. Stock in rather poor condition.

Ceres.—Average rainfall and weather getting warm. Veld in very good condition. Wheat and oats doing well, likewise stock.

Clanwilliam.—Weather hot, dry, and very windy. Veld in very poor condition. Fruit season does not look very promising owing to the damage done by the wind. Extremely poor crops anticipated owing to the drought. What little lucerne is growing is doing well. Stock in fairly good condition.

Douglas.—Weather windy and cold, and veld in fair condition. Fruit and vines doing well. Stock generally in good condition.

Douglas.—Weather cold with no rainfall. Veld inclined to be dry. Very little lucerne grown. Stock in fairly good condition.

East London.—Good rains have fallen and the veld much improved thereby. Oats have suffered somewhat from drought. Lucerne, where it is grown, has benefitted considerably by the rains. Stock in fairly good condition.

Fort Beaufort.—Weather mild, with average rainfall, and veld in good condition. Fruit trees in blossom and looking very promising. Cereals and lucerne doing well, likewise stock.

Griquatown.—Rain hoped for. Veld very dry. Cereals suffering from want of rain. Stock in poor condition.

Jansenville.—Windy weather, and veld beginning to sprout. During September several steady showers fell. Fruit trees in bloom and budding. What vines there are are mostly on Cape stocks. Oats in very good condition, and stock generally doing well.

King William's Town.—Dry weather, with very little rain, and veld in bad condition. What few cereals there are are suffering very much from the effects of drought.

Kimberley.—Weather warm and windy, with light rainfall. Veld getting very dry. Vines doing well, and oats in fairly good condition. Condition of stock fairly satisfactory.

Komgha.—Weather windy and cold, with rain. Veld in medium condition. Fruit trees generally are healthy and free from pests. Stock in good condition.

Lady Frere.—Mild weather, with average rainfall. Stock in very poor condition.

Laingsburg.—Weather warm and windy, showing signs of drought. Veld in poor condition. Fruit not doing very well, especially peaches. Cereals in medium condition. Stock doing poorly, with the exception of horses and pigs.

Ladismith.—Weather dry and cold, with light rainfall. Veld in poor condition. Very little wheat and oats sown. Stock in poor condition.

Malmesbury.—Rainfall light and veld in bad condition. Cereals not doing particularly well. In some parts of the district stock are in good condition, in other parts the reverse.

Middelburg, C.C.—Moist weather, with heavy rainfall. Veld in fair condition. General condition of fruit trees healthy. Cereals rather backward. Stock in fair condition.

Montagu.—Very little rain has fallen until within the past week, the expectation of good rains in late August and September not having been realized. The grass rapidly scorched up—what little there was, and the cereal crops also suffered where no irrigation was possible, and much concern began to be felt. This, however, was dissipated by the splendid fall of rain which took place during the night of October 12 and 13, when 1·10 in. was registered, and the rivers ran full for the first time this year. During the earlier part of the week there had also been some little rain, 0·14 in. being recorded, so that 1½ in. have fallen in the week ending October 13. It has been most welcome and timely. All the vineyards are now in full leaf, and as far as can be judged the stone fruits promise an abundant crop, but the ravages of insect pests have got to be accounted for. All fears of frost may now be practically set at rest, although late nips are not unknown. Owing to the dry state of the veld hitherto obtaining, the stock is reported as being only in medium condition, but as the lucerne cropping has now commenced, such animals as are fed to it will improve their condition, or at least maintain it.

Namaqualand.—Mild weather, with light rainfall, and veld in good condition. Cereals doing well. Stock in good condition. The only section of Namaqualand which is in bad condition is the Bushmanland portion of the Ward Pella, where it is very dry.

Peddie.—Weather cold and dry, with high winds. Average rainfall. Wheat will now be sown as the drought appears to have broken up. Oats in bad condition. Stock doing fairly well.

Piquetberg.—Weather fair, with S.E. winds. Veld in bad condition. Wheat and oats suffering from the drought. Cattle in poor condition. Other stock doing well.

Queenstown.—Weather very windy and dusty until rain fell. Very fair amount of rain fell. Veld in poor condition, but improving. Fruit trees doing well. Crops of cereals very backward. Lucerne coming on very nicely, especially when watered. Stock doing well.

Riversdale.—Fine weather, with good rainfall. Fruit trees in promising condition. All stock doing well, with the exception of pigs.

Robertson.—Mild weather, and veld in satisfactory condition. Vines and fruit promising well. Owing to the rain that has fallen lately, good crops are anticipated. Stock doing well.

Stutterheim.—The first rain after the prolonged drought fell on the 15th ult., and has continued up to date, accompanied by a great fall in the temperature, with the result that numbers of lambs have died. The crops of wheat and oats have perished through the drought. Stock in poor condition.

Tarkastad.—Weather rather windy, with light rainfall. Veld in poor condition. Fruit and vines promising. Young wheat and oats have been much damaged by locusts during this month. Lucerne slightly backward through drought.

Uniondale.—Weather mild, with light rainfall. Veld rather dry. Cereals doing well. Stock in fair condition.

Upington.—Changeable weather, with light rainfall and veld very dry. Vines doing well, also fruit trees. Wheat crop very promising. Stock doing well.

Victoria West.—Weather promising, with S.E. winds and light rainfall. Condition of veld good. Little wheat is sown, but what there is is very promising. Stock doing well.

Van Rhyn's Dorp.—Cold weather, with light rainfall. Veld looking well. Good crop of wheat and oats. Stock in good condition.

THE TRANSKEI.

For the month ending 30th September, 1906.

Flagstaff.—I have nothing of interest to add to my last report, with the exception of the fall of a good rain, which has improved the veld, and stock are improving in condition, and are free from disease.

Kentani.—Copious rains have fallen during the month, putting an end to a prolonged and serious drought. The natives have made a start with their ploughing, sowing Kafir corn and mealies. Stock is in fair condition and the veld is improving. A cattle dipping tank is under construction.

Lusikisiki.—After prolonged dry weather rain fell in moderate quantities towards the end of September. Some of the natives have availed themselves of this and started cultivation, though rather early for them to put in mealies and Kafir corn. There is promise of further early rains. The pasture is improving daily; until the rains fell it was very dry and parched.

Matatiele.—During the early part of the month the weather was hot and dry and gave little or no sign of the drought breaking. However, in the latter part of the month a strong wind got up, which brought up the much needed rain, and a good, steady, soaking rain fell. A spell of cold frosty weather after it, killed off a lot of poor stock, large and small, and retarded the veld greatly. In parts where the rain was

heaviest ploughing operations have commenced. Apart from poverty, there has been no disease amongst stock. A moderate snow storm was experienced along the Drakensberg on the 28th, which did considerable havoc amongst large and small stock.

Mount Ayliff.—The breaking up of the drought was accompanied by great cold and some snow. The veld is becoming green again. Fruit and vines promising. Ploughing has begun. Cattle in poor condition ; other stock doing well.

Mount Frere.—The severe drought continued till the 18th of the month, when very fine rains fell, and in a few weeks there will be plenty of good veld. Stock are in very poor condition, and there has been great mortality among lambs. A large number of cattle went down in the rain. The loss during the past two months in stock of every description is estimated at something over £20,000. There are no slaughter stock to be had, and one butchery has closed in consequence of this.

Nqamakwe.—The past month was very dry until the 18th when rain, lasting four days, came on, and since then rain has been frequent. A considerable number of stock perished owing to the severe cold which accompanied the rain, and to the poor condition of all kinds of stock in consequence of the long period of dry weather. The grass is now beginning to spring, and there are indications of a good season. No locusts have appeared.

Tabankulu.—There is very little of interest to report for the month of September, 1906. The drought continued without a break during the entire month. Hot dry winds prevailed for several days, parching up the little herbage remaining in the veld. Stock generally are consequently in an impoverished condition, and many cases of mortality among them have occurred from that cause ; otherwise they are on the whole free from disease.

Tabankulu.—Sufficient rain fell during September for ploughing, and the natives have cultivated a portion of their lands. Unfortunately cold weather accompanied the rain and a considerable number of stock succumbed. As the veld will now improve, stock will soon regain their normal condition. No diseases have been reported.

Willowvale.—Copious rains have fallen during the past month, and, if they continue, a good harvest may be expected next season. The veld, which presented a very parched appearance at the beginning of the month is now in fair condition. Ploughing has commenced amongst the natives. Cattle are in good condition, and free of disease. Horses are improving, and sheep and goats are doing well.

NOTES ON THE WEATHER OF SEPTEMBER, 1906.

By CHARLES M. STEWART, B.Sc., Secretary to the Meteorological Commission.

A mean pressure slightly above the average (+0.013 in. at the Royal Observatory), mean temperature slightly more than one degree cooler than usual, a percentage of cloud higher than the normal, with a marked increase in the number of fogs and mists, a moderate number of thunder and hailstorms, with a mean rainfall of slightly greater depth than usual, some frosts of no great severity and a moderate fall of snow over the more easterly parts of the Central Karoo and the North-East, on the 24th and 25th, were the leading characteristics of the weather of September.

Division.	Mean Rainfall (1906).	Mean No. of Days.	Average Rainfall (1891-1900).	Average No. of Days.	Actual Differences from Aver- ages.	Percentage Differences from Aver- ages.
	Inches.		Inches.		Inches.	Per cent.
Cape Peninsula ..	2.27	9	3.55	10	- 1.08	- 30
South-West ..	0.98	5	1.99	6	„ 1.01	„ 51
West Coast ..	0.25	2	0.74	10	„ 0.49	„ 66
South Coast ..	2.69	9	2.26	7	+ 0.43	+ 19
Southern Karoo ..	0.69	4	0.83	3	- 0.14	- 17
West Central Karoo ..	1.12	4	0.53	2	+ 0.59	+ 211
East Central Karoo ..	1.57	5	0.96	2	„ 0.61	„ 64
Northern Karoo ..	1.11	3	0.42	2	„ 0.69	„ 164
Northern Border ..	0.06	1	0.15	1	- 0.09	- 60
South-East ..	3.13	8	2.14	6	+ 0.99	+ 46
North-East ..	1.45	6	0.99	3	„ 0.46	„ 46
Kaffraria ..	3.54	10	2.05	5	„ 1.49	„ 73
Basutoland ..	2.70	6	1.22	4	„ 1.48	„ 121
Orange River Colony ..	0.50	1	0.73	2	- 0.23	- 32
Durban (Natal) ..	3.84	12	3.49	..	+ 0.35	+ 10
Bechuanaland ..	0.02	1	0.40	1	- 0.38	- 93
Rhodesia ..	1.12	3	0.16	1	+ 0.96	+ 600

Precipitation.—The mean rainfall, based on records received from 342 stations, was 1.85 in. falling on six days. Although this amount is 1.99 ins. less than what was recorded in the corresponding month of 1905, it is 0.79 in. more than the mean for August and 0.18 in. or 11 per cent. above the average. Compared with last month the means for the various divisions shew a general increase, except over the Cape Peninsula, the South-West and the West Coast, where was a deficit compared with the average of 30 to 66 per cent. Deficient rainfall was also experienced over the Southern Karoo, the Northern Border, the Orange River Colony and Bechuanaland.

The accompanying table shews that the best watered areas were Kaffraria and the South-East, together with the coastal divisions of the Cape Peninsula and the South Coast. Fairly good rains fell over Basutoland, and in a less degree over the North-East Division and the eastern portions of the Karoo, but had not penetrated inland as far as the Northern Border and Bechuanaland, and were only slightly felt over the Orange River Colony, the major portion of these areas, together with the West Coast, having suffered from partial or absolute drought throughout the month. An analysis of the totals for the month shews that there was a comparative absence of large amounts, the rains being mostly of a light and soaking nature, well suited for facilitating agricultural operations. Of the 342 stations, only 19 reported *Nil*, and these were almost wholly confined to the West Coast, the Northern Border and Bechuanaland. Of the remainder, 91 had 0.01—1 in.; 105 had 1.01—2 ins.; 60 had 2.01—3 ins.; 39 had 3.01—4 ins.; and 17 had 4.01—5 ins., leaving eleven with over 5 ins., of which number

the largest total was 11·63 ins. at Evelyn Valley, five having 5·01—6 ins., and an equal number 6·01—7 ins. A similar result is obtained on tabulating the maximum daily falls, as out of 335 stations furnishing the necessary details, 229 (omitting those with "No rainfall") had maxima of 0·01—1 in.; while eighty had 1·01—2 ins. as the greatest amount in 24 hours, leaving only seven with over 2 inches. These last were entirely confined to the South-East, Kaffraria, and Basutoland, Maseru heading the list with 2·67 ins. on the 21st, and Port St. John's coming next with 2·47 ins. on the 18th, the other maxima occurring mostly on the 24th. *Thunderstorms* were reported from 114 stations on 21 days of the month, most numerous on the 14th, 21st, and 22nd. *Hail* was noted at 20 stations on 7 days (principally the 20th, 21st, and 24th. *Snow* fell at altogether 34 stations on 3 days, and *Sleet* at 10 places also on three days. The snowfall of the 24th and 25th occurred mostly at the higher stations over an irregularly triangular area which may be roughly indicated as enclosed by lines drawn from Qacha's Nek, in Basutoland, south-westwards to New Bethesda, in the Graaff-Reinet Division, thence eastwards to the Kologha Range, and northwards to Qacha's Nek. The ground was covered to a depth of three inches (3 ins.) at Maraisburg, whilst the snow was two inches (2 ins.) deep at Cyphergat.

Temperature, Cloud, and Wind.—The mean temperature of all stations during September was 57·3°, being 5° F warmer than in August, but 1·3° cooler than the average. The deficit in the mean temperature was unequally divided between the day and night, the mean maximum (68·6°) being 1·7° and the mean minimum (46·0°) being 0·8° lower than usual, reducing the mean daily range from 23·5° to 22·6°. Over the West and South-West, there was a deficit of 1—2 degrees, whilst along the South Coast this was reduced in amount to 0·5°—1·0°, whilst over the Eastern Divisions of the Colony the monthly temperature was mostly about one degree colder than usual. At the more inland stations the mean for the month was 1—1·5 degrees higher than usual, the greatest excess being 1·6° at Hanover. The deficiencies in the maximum temperature were mostly between 1 and 2 degrees, increasing, however, to 3 degrees at Amalienstein. On the other hand, there was an excess over the average of about one degree at such inland stations as King William's Town, Hanover, Hopetown, and Kimberley. The deficits from the averages in the mean minimum temperatures varied from —0·2° at King William's Town and Port St. John's to —2·5° at O'okiep, whilst the excesses in night temperatures ranged from + 0·2° at Kokstad to + 2·3° at Aliwal North. The mean warmest station was Hope Fountain, near Bulawayo, with 66·4°, and the mean coldest Bensonvale, with 52·6°, a difference of 13·8°. The highest mean maximum was 81·0° at Kimberley, and the lowest mean minimum 36·8° at Bensonvale. The warmest period of the month was most generally from 6th to 10th, although some of the highest temperatures were also registered on the 18th, 16th, 19th, to 22nd and 29th; the absolute minima for the month occurred over the Western half of the country, mostly on the first 5 days of the month, whereas in the Eastern half the lowest temperatures occurred almost wholly on the 25th and 26th. The mean value of the absolute maxima during September was 81·8° or 0·4° less than in August, whereas the mean of the corresponding minima was 45·9° or 7·° higher than during the previous month. The mean monthly range was, therefore, only 45·9° as against 53·3° for August. The absolute maximum for the month was 90·0° at King William's Town on the 10th, and the absolute minimum 23·0° at Murraysburg on the 4th, shewing an extreme monthly range of 76°, as against 84° in August.

Frosts were of most common occurrence during the last week of the month particularly on the 25th and 26th. Although they were reported as being fairly severe on these two days, comparatively little damage was done to fruit-trees or growing crops. In all, only 36 instances of this phenomenon were noted on 15 days, chiefly over the inland districts, although some low temperatures approaching the Freezing Point were registered at those stations near the coast.

Many of the peculiarities associated with the temperature during this month may be ascribed to the effects of the unusually high mean percentage of *Cloud* (46 per cent.) which is 7 per cent. above the average and 8 per cent. more than during August. The skies were clearer than usual over the South Western Districts by 5 to 10 per cent. but the amount of cloud was considerably above the average over practically the whole of the remainder of the Colony. The proportion of sky obscured was about 40 per cent. in the West, between 45 and 55 per cent. in the South-West, between 60 and 70 per cent. along the South Coast and the South-East but decreasing to less than 50 per cent., over the Northern Border. The skies were cloudiest at Danger Point where the mean percentage obscured was 70 per cent. and were clearest at Bethulie and Hope Fountain where the mean proportion of cloud was only 16 per cent., for the month. *Fog and Mist* were of much more frequent occurrence than during the preceding month, 135 cases being noted on 27 days, most widely on the 14th and 17th to 19th, the only three days on which this phenomenon was not reported being the 4th, 12th and 28th.

The month of September was unusually calm, the mean *Wind Force* at 8.30 a.m. being only 1.78, corresponding to a mean velocity of 11.9 miles per hour, or 1.75 in. per hour less than during August. Although the prevailing wind direction over the Cape Peninsula was Southerly as usual during this month, this was associated with a marked decrease in those winds having a Westerly component, and a corresponding increase in those winds blowing from a direction between E.S.E. and South and in the number of calms. Generally speaking the prevailing winds were Westerly over the Southern half of the country and Easterly (N.E. to S.E.) over the northern portions. There was a comparative absence of strong winds during the month, *Gales* being reported from only 12 stations on 6 days, principally on the 24th. *Hot Winds* occurred at 4 stations on 3 days. *Duststorms* occurred at 19 stations on 13 days, being about twice as numerous as during the month of August.

OBSERVERS' NOTES, SEPTEMBER, 1906.

GROOT DRAKENSTEIN.—Another cold dry month. Mean temperature of month 22° below average (7 years). Extreme minimum 34.9°, lowest temperature yet recorded in September. Rainfall 1.28 inches below average 13 years (3.04 inches). Total rainfall: January—September 21.32 inches, average 31.32 inches, deficiency 10.09 inches.

KOKSTAD (The Willows).—Drought broke up on the 17th, and a steady downpour continued for several days. Although no very great quantities of rain fell, an immense amount of good will result, as all anxiety is now relieved. There have been a few losses from cold weather in stock, on the 24th and 25th, but there will soon be plenty of pasturage.

VRECHTBAAR.—Both fruit and cereal crops very promising and will be the best we have had for some years, if nothing unforeseen turns up.

VARIES.—Rain badly wanted throughout district. Crops very poor; very poor outlook, failing early rains.

THEEPONTEIN.—Light frosts in first week of month, sharp on 26th. Rains preceded by strong South East wind. Drought far from broken here.

THE MEADOWS.—Rain came in time to save many farmers moving their stock.

SUNNYSIDE (Albany).—Country looking well after recent rains. One case of *Sponziekte*.

KOKSTAD.—Drought completely broken. On account of the very cold rains farmers lost heavily in stock, especially young sheep, lambs and poor cattle. Lung-sickness has broken out in this and surrounding districts.

CARNARVON FARM.—This has been another extraordinary September. Well above the average for rain 1.24 inches was only beaten in the last five years by 1905 (3.51 inches). Frosts only three. The effect of the apparently severe frosts was neutralized by the saturation of the air. Cloudless days, three about the average. The wheat crop is a comparative failure but mealies and potatoes will no doubt be sown and planted wholesale.

TEMPERATURES, SEPTEMBER, 1906.

Stations	Mean Max.	Mean Min.	Monthly Mean.	Abs. Max.	Date.	Abs. Min.	Date.
Royal Observatory ..	63·6	48·6	56·1	74·1	21	34·8	4
Devil's Peak ..	61·6	44·8	52·9	82·0	8	39·0	1
Cape Town (Hospital) ..	63·0	48·6	55·8	73·2	21	41·5	2
Do. (S.A. College) ..	64·7	47·4	56·0	74·0	20	41·0	2, 3 & 5
Simon's Town ..	66·0	52·2	59·1	74·8	9	46·4	5
Table Mountain (Disa Head)	56·5	42·1	49·3	86·0	8	36·0	1 & 2
Sea Point ..	62·7	48·7	55·7	73·3	21	42·5	2 & 5
Wynberg ..	65·7	47·5	56·6	78·0	22	39·5	5
Wellington ..	62·7	44·6	53·7	76·8	7	37·0	3
Ceres ..	67·2	42·0	54·6	80·0	8	30·0	25
Elsenburg Ag. College ..	64·2	43·8	54·0	73·2	21	34·0	2
Groot Drakenstein ..	66·9	46·6	56·2	78·2	9	34·9	3
Port Nolloth ..	60·5	45·1	52·8	71·0	20	36·0	2
O'okiep ..	69·7	44·5	57·1	86·0	8	35·0	19
Cape L'Agulhas ..	60·7	51·7	56·2	65·0	29	45·0	2
Cape St. Francis ..	64·0	52·6	58·3	73·0	10	45·0	2
Storm's River ..	67·4	46·9	57·2	90·0	10	37·5	1 & 2
George Plantation ..	63·2	47·8	55·5	79·0	13	39·0	5
Port Elizabeth ..	65·6	52·1	58·8	74·0	22	44·0	4
Heidelberg ..	70·7	46·3	58·5	84·0	29	35·0	2, 3 & 5
Amalienstein ..	71·7	44·3	58·0	92·0	9	34·0	5
Hanover ..	70·4	37·7	54·0	81·0	9	25·0	5
Murraysburg ..	70·5	40·6	55·6	82·0	9	23·0	4
Hope Town ..	77·9	43·4	60·6	86·2	10	37·0	3
Kimberley ..	81·0	46·3	63·6	90·0	16	37·5	22
Sydney's Hope ..	67·1	47·1	57·1	91·5	10	37·0	25
East London ..	67·8	54·4	61·1	75·0	22	47·0	26
King William's Town ..	76·9	48·2	62·6	99·0	10	34·0	25
Cathcart ..	67·3	44·3	55·8	82·4	9	35·2	26
Stutterheim ..	69·5	49·0	59·2	90·5	10	38·5	25 & 26
Evelyn Valley ..	65·5	45·4	55·4	86·0	10	33·0	25
Aliwal North ..	73·2	42·2	57·7	83·0	6	30·5	26
Rietfontein (Aliwal North)	69·3	41·2	55·2	78·0	6	28·6	26
Bensonvale Institute ..	68·5	36·8	52·6	79·0	10	24·0	25
Main ..	70·4	47·1	58·8	90·5	6	36·0	25
Port St. John's ..	70·6	54·8	62·7	77·0	6	44·0	25
Umtata ..	72·7	46·1	59·4	94·0	6	31·0	19
Tabankulu ..	71·0	47·4	59·2	90·0	7	35·3	26
Kokstad (The Willows)	71·1	43·3	57·2	86·5	6	32·5	26
Leribe ..	71·5	48·3	59·9	81·5	16	32·8	25
Mohalie's Hoek ..	70·4	42·3	56·4	80·0	10	27·0	16
Teyateyaneng ..	76·8	40·9	58·8	82·0	16	30·0	26
Bethulie (O.R.C.) ..	71·9	41·8	56·8	81·2	29	32·0	21
Kuruman ..	78·6	42·5	60·6	85·6	14	31·0	26
Hope Fountain ..	79·8	53·0	66·4	90·0	19	47·0	9
Means ..	68·6	46·0	57·3	81·8	..	35·9	..
Extremes ..	..	..	..	99·0	10	23·0	4

RAINFALL, SEPTEMBER, 1906.

I. CAPE PENINSULA :

INCHES.

Royal Observatory (a) 12 inch gauge ..	0.99
Cape Town, Fire Station ..	1.23
Do South African College ..	2.38
Do Molteno Reservoir ..	2.19
Do Platteklip ..	3.04
Do Signal Hill ..	0.74
Do Hospital ..	0.73
Do Sea Point (Hall) ..	0.90
Do do. (Attridge) ..	0.87
Camp's Bay ..	1.10
Table Mountain, Disa Head ..	2.15
Do Kasteel's Poort ..	3.68
Do Waai Kopje ..	3.78
Do St. Michael's ..	5.12
Devil's Peak, Block House ..	4.51
Do. Nursery ..	3.79
Woodstock (Hall) ..	1.23
Do (Municipal Quarry) ..	2.97
Do (with Nipher's Shield) ..	3.39
Newlands (Montebello) ..	3.77
Claremont (Carrigeen) ..	3.50
Bishopscourt ..	2.78
Kenilworth ..	2.82
Wynberg (St. Mary's) ..	2.22
Groot Constantia ..	2.53
Tokai Plantation ..	1.76
Plumstead (Culmwood) ..	1.56
Muizenberg (Storage Res.) ..	2.38
Simon's Town (Wood) ..	1.43
Do. (Gaol) ..	0.95
Cape Point ..	0.18
Robben Island ..	0.74
Maitland Cemetery ..	0.92
Tamboer's Kloof (Monte Vista) ..	1.83
Newlands Reservoir (No. 1) ..	3.81
Do (No. 2) ..	3.71

II. SOUTH-WEST :

Eerste Rivier ..	0.97
Klapmuts ..	1.43
Stellenbosch (Gaol) ..	1.27
Somerset West ..	0.59
Paarl ..	2.01
Wellington (Gaol) ..	2.54
Groot Drakenstein (Wetevraden) ..	1.76
Porterville Road ..	0.55
Tulbagh ..	0.30
Ceres Road ..	0.25
Ceres ..	0.71
Rawsonville ..	0.61
Caledon ..	0.55
Worcester (Gaol) ..	0.32
Do. (Station) ..	0.44
Hex River ..	0.00
Robertson (Gaol) ..	0.63
Do (Govt. Plantation) ..	0.54
Montagu ..	0.15
Danger Point ..	1.39
Vijgebooms River ..	1.58
Elgin Plantation ..	1.57
Elsenburg Agricultural College ..	1.50
Roskeen ..	1.12
Vruchtbaar ..	1.16

III. WEST COAST :

Port Nolloth ..	0.00
Anenous ..	0.00
Klipfontein ..	0.05
Kraaifontein ..	0.00
O'okiep ..	0.00
Springbokfontein ..	0.01
Garies ..	0.00
Clanwilliam (Gaol) ..	0.27
Dassen Island ..	0.39
Kersefontein ..	0.41
The Towers ..	0.81
Malmesbury ..	0.57
Piquetberg ..	0.71
Zoutpan ..	0.54
Wupperthal ..	0.00

IV. SOUTH-COAST :

Cape L'Agulhas ..	0.67
Bredasdorp ..	1.82
Swellendam ..	3.35
Zuurbraak ..	2.79
Grootvaders Bosch ..	4.77
Heidelberg ..	2.24
Riversdale ..	1.23
Vogel Vlei ..	0.62
Mossel Bay ..	0.76
Great Brak River ..	0.91
George ..	2.19
Do (Plantation) ..	2.23
Woodifield (George) ..	2.69
Millwood ..	2.63
Sour Flats ..	1.92
Concordia ..	4.26
Knysna ..	2.43
Buffels Nek ..	3.16
Plettenberg Bay ..	1.93
Ilarkerville ..	3.61
Blaauwkrantz ..	4.25
Lottering ..	3.21
Storm's River ..	4.23
Witte Els Bosch ..	4.17
Cape St. Francis ..	4.28
Witteklip (Sunnyside) ..	3.10
Uitenhage (Gaol) ..	2.23
Do (Park) ..	2.11
Armada (Blue Cliff) ..	2.62
Port Elizabeth (Harbour) ..	2.85
Do. (Walmer Heights) ..	4.44
Shark's River (Nursery) ..	3.29
Do (Convict Station) ..	3.64
Tankara ..	2.38
Centlivres ..	1.20

V. SOUTHERN KAROO :

Ladismith ..	1.07
Amalienstein ..	1.02
Calitzdorp ..	0.00
Oudtshoorn ..	0.37
Vlaakte Plaats ..	0.33
Uniondale ..	1.33

VI. WEST CENTRAL KAROO: INCHES

Fraserburg Road ..	0.17
Prince Albert ..	0.65
Zwaartberg Pass ..	4.13
Beaufort West (Gaol) ..	1.45
Nel's Poort ..	0.92
Camfer's Kraal ..	0.75
Baaken's Rug ..	0.98
Willowmore ..	0.15
Steytlerville ..	0.85

VII. EAST CENTRAL KAROO:

Buffels Kloof ..	2.28
Aberdeen (Gaol) ..	1.45
Corndale ..	2.17
Aberdeen Road ..	1.06
Klipplaat ..	0.95
Klipdrift ..	1.36
Kendrew (Holmes) ..	1.42
Do ..	1.33
Graaff-Reinet (Gaol) ..	1.80
Do (Eng. Yard) ..	1.78
New Bethesda ..	1.67
Rodebloem ..	1.51
Glen Harry ..	0.97
Bloemhof ..	1.06
Patryfontein ..	2.25
Rode Hoogte ..	2.49
Toegedacht ..	0.93
Klipfontein ..	1.13
Cranemere ..	1.05
Pearston ..	1.28
Darlington ..	0.75
Somerset East (Gaol) ..	3.56
Middleton ..	1.21
Spitzkop (Graaff-Reinet) ..	1.70
Bruintjes Hoogte ..	1.98

VIII. NORTHERN KAROO:

Calvinia ..	0.00
Sutherland ..	0.21
Fraserburg ..	0.11
Carnarvon ..	0.11
Brakfontein ..	1.25
Victoria West ..	1.48
Doorskuilen ..	1.11
Britstown ..	0.99
Wilbebestkooij ..	0.12
Murraysburg ..	1.17
De Kruis (Murraysburg) ..	1.18
Richmond ..	1.39
Hanover ..	0.75
Boschfontein ..	0.35
Petrusville ..	0.64
The Willows (Middelburg) ..	2.02
Jackalsfontein ..	1.10
Ezelpoort ..	0.95
Plaatberg ..	0.96
Grape Vale ..	1.24
Ezelfontein ..	1.10
Rodepoort ..	1.07
Groenkloof ..	1.08
Vlakfontein ..	1.03
Vogelsfontein ..	0.97
Plaatfontein ..	0.95
Tafelberg Hall ..	1.55

VIII. N. KAROO—continued INCHES

Fish River ..	2.11
Varken's Kop ..	1.69
Culmstock ..	1.59
Droogfontein ..	1.42
Craddock (Gaol) ..	1.84
Witmoos ..	1.72
Maraisburg ..	1.76
Steynsburg (Gaol) ..	0.60
Riet Vlei ..	1.46
Hillmoor ..	2.46
Quagga's Kerk ..	2.31
Tarkastad (Dis. Engineer) ..	1.58
Drummond Park ..	1.35
Waverley ..	1.72
Rietfontein (Dis. Colesburg) ..	0.28
Schuilhoek ..	0.67
Vosburg ..	0.44
The Meadows (Schoombie) ..	1.10
Craddock ..	1.92
Theefontein (Dis. Hanover) ..	0.73

IX. NORTHERN BORDER:

Keimoes ..	0.00
Kenhardt ..	0.00
Upington ..	0.00
Trooillapspan ..	0.12
Van Wyk's Vlei ..	0.13
Prieska ..	0.30
New Year's Kraal ..	0.00
Karree Kloof ..	0.00
Campbell ..	0.00
Hope Town ..	0.04
Newlands (Barkly West) ..	0.04
Barkly West ..	0.03
Bellsbank ..	0.00
Kimberley (Gaol) ..	0.00
Do (Stephens) ..	0.05
Strydenburg ..	0.30

X. SOUTH-EAST:

Melrose (Div. Bedford) ..	1.74
Dagga Boer ..	3.04
Fairholt ..	2.38
Oheviot Fells ..	2.87
Bedford (Gaol) ..	4.23
Sydney's Hope ..	2.60
Adelaide ..	2.49
Atherstone ..	2.39
Alexandria ..	2.90
Salem ..	2.62
Fort Fordyce ..	4.05
Graham's Town (Gaol) ..	2.34
Heatherton Towers ..	1.26
Sunnyside ..	1.91
Vischgat ..	2.95
Fort Beaufort ..	4.17
Balfour ..	3.34
Seymour ..	2.65
Glencairn ..	2.83
Port Alfred ..	3.05
Hogsback ..	4.53
Peddie ..	2.58
Erwell Park ..	0.47
Keiskama Hoek ..	3.52
Cathcart (Gaol) ..	1.58

X. SOUTH-EAST—*continued*

	INCHES
Cathcart (Forman) ..	1 49
Do ..	1 79
Thaba N'doda ..	6 54
Evelyn Valley ..	11 63
Crawley ..	0 87
Thomas River ..	1 29
Perie Forest ..	4 82
Forestbourne ..	5 43
Isidenge ..	5 43
Kologha ..	3 37
King William's Town (Gaul) ..	1 86
Do (Dr. Egan) ..	2 66
Stutterheim (Besté) ..	1 99
Fort Cunynghame ..	3 21
Kubusie ..	1 38
Quacu ..	2 24
Fort Jackson ..	2 35
Prospect Farm (Div. Komgha) ..	3 99
Komgha (Gaul) ..	3 91
East London, West ..	3 07
Cata ..	4 55
Wolf Ridge ..	4 89
Dontsah ..	5 14
Mount Coke ..	3 50
Blackwoods ..	3 94
Albert Vale (near Bedford) ..	1 85
Heatherton (Irrigation Works) ..	1 20

XI. NORTH-EAST :

Venterstad ..	0 44
Burghersdorp (Gaul) ..	0 99
Ellesmere ..	0 85
Molteno ..	1 22
Lyndene ..	0 73
Cyphergat ..	1 96
Thibet Park ..	1 27
Sterkstroom (Station) ..	1 76
Do (Gaul) ..	1 88
Rocklands ..	1 39
Aliwal North (Gaul) ..	0 66
Do (Brown) ..	0 82
Buffelsfontein ..	1 44
Carnarvon Farm ..	1 94
Jamestown ..	1 15
Whittlesea ..	1 35
Queenstown (Gaul) ..	1 96
Rietfontein (Aliwal North) ..	0 92
Dordrecht ..	1 65
Tylden ..	1 01
Herschel ..	2 06
Lady Grey ..	1 80
Lauriston ..	2 34
Lady Frere ..	1 70
Contest (near Bolotwa) ..	1 75
Keilands ..	1 49
Barkly East ..	1 37
Blikana ..	2 16
Rhodes ..	0 76
Albert Junction ..	0 70

XI. NORTH-EAST : *Continued*

Hughenden ..	1 32
Glenwallace ..	2 02
Indwe (Dis. E's Office) ..	1 65
Bensonvale Inst. (Herschel) ..	1 58
Cathcart (Queenstown) ..	1 56
Royal (Albert) ..	2 63

XII. KAFFRARIA :

Ida (Xalanga) ..	2 28
Cofimvaba ..	1 91
Tsomo ..	2 37
N'qamakwe ..	2 98
Main ..	3 32
Engcobo ..	3 58
Butterworth ..	3 35
Kentani ..	6 36
Maclear ..	3 46
Bazeya ..	6 76
Willowvale ..	6 17
Mount Fletcher ..	2 79
Somerville (Tsolo) ..	2 11
Elliotdale ..	4 45
Mqanduli ..	3 61
Umtata ..	3 36
Cwebe ..	5 50
Tabankulu ..	3 29
Kokstad ..	1 11
Do (The Willows) ..	1 58
Flagstaff ..	3 16
Insikeni ..	2 62
Port St. John's ..	6 93
Umzimkulu ..	1 93

XIII. BASUTOLAND :

Mohalie's Hoek ..	2 57
Maseru ..	3 26
Teyateyaneng (Berea) ..	2 45
Qacha's Nek ..	2 03
Leribe ..	3 17

XIV. ORANGE RIVER COLONY :

Kroonstad ..	0 20
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XV. NATAL :

Durban, Observatory ..	3 84
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XVII. BECHUANALAND :

Taungs ..	0 03
Vryburg ..	0 00
Setlagoli ..	0 07
Kuruman ..	0 00

XVIII. RHODESIA :

Hope Fountain ..	1 42
Rhodes' Matopo Park ..	0 51

CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 13th October, 1906, ruling at the several centres named, is published for general information:—

CENTRE.	A Wheat per 100 lb.	B. Wheat Flour per 100 lb.	C. Roor Meal per 100 lb.	D. Mealies per 100 lb.	E. Mealie Meal per 100 lb.	F. Barley per 100 lb.	G. Oats per 100 lb.	H. Oat-hay per 100 lb.	J. Pota- toes per 100 lbs.	K Tobacco (Bor Roi) per lb.	L Beef per lb.	M. Mutton per lb.	N. Fresh Butter per lb.	O. Eggs, per dozn.	P. Cattle (Slaughter) £9 to £10	Q. Sheep (Slaughter)
Allwal North	£ s. d. 0 9 0	£ s. d. 0 18 6	£ s. d. 0 14 0	£ s. d. 0 7 6	£ s. d. 0 6 6	£ s. d. 8 6	£ s. d. 10 5	£ s. d. 0 7 0	£ s. d. 0 5 6	£ s. d. 1/6 to 4/-	£ s. d. 10d to 8d	£ s. d. 10d to 8d	£ s. d. 0 2 4	£ s. d. 1 3	£15 to £10	21/-
Beaufort West	0 13 0	0 17 0	0 13 0	0 9 0	0 12 6	10 6	10 5	0 7 0	0 12 0	0 0 10	10d to 1s	10d to 7d	0 1 6	1 0	£15	23/6
Bethersdorp	0 9 6	0 7 0	0 17 3	0 8 6	0 9 0	8 0	8 0	0 4 6	0 7 6	1/4, 1/3, 1/6	10d to 1s	10d to 7d	0 2 0	1 0	£15	25/-
Capetown	10 6d 13/-	0 12 6	14/- to 21/6	0 11 0	0 9 0	10 0	10 6	0 4 6	0 8 6	0 3 0	0 8	10d to 8d	0 1 3	1 6	£16 to £20	22/-
Clanwilliam	0 9 0	0 12 0	0 10 6	0 8 6	0 9 0	6 0	5 6	0 5 6	0 11 6	0 0 6	0 6	0 6	0 1 1	1 3	£10	...
Colesberg	0 9 0	0 13 0	0 10 6	0 7 5	0 15 6	7 0	5 9	0 4 9	0 8 0	0 0 6	0 8	0 7	0 2 1	1 5	£10	...
Dordrecht	0 8 0	0 12 0	0 10 6	0 7 6	0 9 0	6 0	6 3	0 6 0	0 11 6	0 1 0	0 8	0 7	0 2 0	1 2	£11	27/6
East London	0 12 0	0 12 0	0 10 3	0 7 6	0 9 0	7 0	6 0	0 6 0	0 11 6	0 1 6	0 8	0 7	0 2 0	1 3	£11	...
Graham's Town	0 9 0	0 10 0	0 11 6	0 8 6	0 11 0	5 3	7 0	0 4 6	0 9 0	0 0 5	0 5	0 5	0 1 1	1 0	£13 to £14	19/- to 23/-
Kimberley	0 11 0	0 15 0	0 12 3	0 7 6	0 7 3	8 0	9 0	0 6 0	0 17 0	0 0 7	0 10	0 8	0 2 0	1 0	£14	£1 4s.
King Wm's Town	0 7 6	0 14 6	0 12 0	0 7 0	0 8 6	6 6	8 0	0 4 6	0 9 0	0 0 4	0 6	0 7	0 1 1	1 3	£13 10s.	£1 5s.
Malmebury	0 9 0	0 14 6	0 10 6	0 11 0	0 9 0	8 6	8 0	0 4 3	0 14 0	0 1 0	0 8	0 7	0 1 1	1 3	£13 10s.	...
Mossel Bay	0 15 0	0 15 0	0 18 0	0 16 6	0 10 0	4 0	8 0	0 6 0	1 0 0	0 1 0	0 9d & 10d	0 9	0 1 1	1 0	£13 10s.	...
Port Alfred	0 10 0	0 19 0	0 14 0	0 9 0	0 10 0	10 0	8 0	0 4 6	0 13 6	0 1 0	0 7	0 9	0 1 1	1 0	£13 10s.	...
Port Elizabeth	0 6 6	0 11 3	0 6 6	0 6 3	0 7 9	5 9	7 0	0 4 6	0 10 6	0 1 0	0 6	0 7	0 1 1	1 2	£13 10s.	...
Queen's Town	1 0	0 13 0	0 12 0	0 8 6	0 11 0	6 0	6 0	0 5 3	0 7 6	0 1 0	0 6	0 7	0 2 3	1 0	£12 to £14	20/- to 23/-
Tarkastad	1 1 6	0 13 0	0 14 3	0 8 0	0 9 6	8 0	10 0	0 5 6	0 6 6	0 1 3	0 10	0 9	0 2 0	1 0	£12	20/-
Vryburg	0 10 0	0 14 0	0 10 6	0 8 0	0 9 0	8 0	8 0	0 5 0	0 10 0	0 0 6	10d to 8d	10d to 8d	0 1 6	1 0	£10 to £16	18/-
Worcester	0 10 0	0 14 0	0 10 6	0 8 0	0 9 0	8 0	8 0	0 5 0	0 10 0	0 0 6	10d to 8d	10d to 8d	0 1 6	1 0	£10 to £16	22/- to 25/-

NOTE.—A blank space denotes "no transactions."

* Colonial.

† Imported.

DEPARTMENTAL NOTICES.

Application for the Services of Government Veterinary Surgeons.

As there are now several qualified Veterinary Surgeons in private practice at Cape Town and its vicinity, Kimberley and Port Elizabeth, the services of Government Veterinary Surgeons in these places will be available only in cases where an animal is suffering from contagious or infectious diseases, or in cases which are, on other grounds, of public interest and importance.

Farmers and owners of stock throughout the Colony frequently telegraph for one of the Government Veterinary Surgeons to be sent to attend to some valuable animal which has been taken seriously ill. It is rarely possible to comply with these requests at once; in the first place, because it is seldom that the Veterinary Officers can be communicated with immediately by telegraph, as they are generally engaged in the country at some distance from a telegraph station; and in the second place, because the only Veterinary Officer who may be at liberty to leave the work upon which he is engaged at the time may be at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any real service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the Veterinary Staff discredited. It would be much more satisfactory therefore in all cases in which veterinary advice and assistance are required, if the owner would telegraph to "Veterinus," Cape Town, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This would enable the Chief Veterinary Surgeon to telegraph advice at once, and state whether he were able to arrange for veterinary attendance on the case or not, and thereby save valuable time, which is always of importance in acute and urgent cases.

It must, however, be clearly understood that, as this arrangement is intended purely for the benefit of farmers, the Government cannot accept any responsibility whatever, pecuniary or otherwise, for any loss of stock, etc., which may result from the treatment or advice of any Government Veterinary Surgeon.

Applicants for the services of the Government Veterinary Surgeons must, at their own cost, provide the necessary transport for the conveyance of these Officers from and back to their residence or nearest Railway or Post Cart Station.

J. D. BORTHWICK,
Chief Veterinary Surgeon.

Veterinary Branch,
Department of Agriculture, 31st October, 1906.

List of Cape Government Veterinary Surgeons.

Stations.				Names.
Cape Town .. ..	..	..	..	Mr. C. Goundry, M.R.C.V.S.
Cape Town .. ..	..	..	..	Mr. J. H. L. Lyons, M.R.C.V.S.
East London .. ..	..	..	..	Mr. R. W. Dixon, M.R.C.V.S.
Elsenburg (Mulders Vlei) ..	..	..	..	Mr. R. Paine, M.R.C.V.S.
Kokstad .. ..	..	..	..	Mr. M. A. Hutchence, M.R.C.V.S.
Molteno .. ..	..	..	..	Mr. W. G. Pakeman, M.R.C.V.S.
Mossel Bay .. ..	..	..	..	Mr. J. A. Robinson, M.R.C.V.S.
Oudtshoorn .. ..	..	..	..	Mr. S. Elley, M.R.C.V.S.
Somerset East .. ..	..	..	..	Mr. J. Spreull, M.R.C.V.S.
Uitenhage .. ..	..	..	..	Mr. G. W. Freer, M.R.C.V.S.
Umtata .. ..	..	..	..	Mr. P. X. Kearney, M.R.C.V.S.
Vryburg .. ..	..	..	..	Mr. J. Neill, M.R.C.V.S.
Worcester .. ..	..	..	..	Mr. A. Goodall, M.R.C.V.S.

Application for Agricultural Employment.

Louis A. Lauder, 2, Rowlands Cottages, Klipper Road, Newlands, Cape.—Employment wanted in dairying or general farm work. Understands treatment of cattle and horses, also of livestock generally, together with land cultivation. References good. Age 41. Married; two children.

Trout Fishing Regulations.

The following regulations *re* Trout Fishing are promulgated under Proclamation No. 340, dated, Sept. 24, 1906 :—

It shall be lawful to fish for Trout in the Berg, Breede, Eerste, Hex, Lourens and Palmiet Rivers and River Zonder End, and in any of the tributaries thereof, and in Princess Vlei, Rondevlei and Seacow Vlei, in the Cape Division, between the first day of October in any year and the fifteenth day of January in the following year, both days inclusive; and in the Buffalo, Izeli, Keiskama and Kabusi Rivers, and in the tributaries thereof, between the first day of October in any year, and the thirty-first day of March in the following year, both days inclusive; provided the following conditions be observed, namely :—

- (a) That no person shall fish for, capture, pursue, or destroy trout of any variety, without having first registered his name with, and obtained a permit from the Resident Magistrate of any of the following Districts, viz.: Cape Town, Paarl, Stellenbosch, Wellington, Tulbagh, Piquetberg, Worcester, Port Elizabeth, East London, King William's Town and Grahamstown.
- (b) That fishing shall be with rod and line only, and that artificial fly only be used as a lure: no phantom or other minnows or spoons, no dead or live baits, and no nets or other mode of capture allowed, but this shall not be held to exclude the use of a legitimate net or gaff for landing the fish caught.
- (c) That if any trout less than 12 inches in length be caught, it shall be forthwith returned to the water from which it was taken with as little delay and as little injury as possible, and that the number of trout of 12 inches in length and over which may be caught by anyone person in one day shall not exceed 6.
- (d) That the consent of the owner on whose ground it is proposed to fish be first obtained.
- (e) That the permit issued be produced for inspection when demanded by any member of the Police Force, Forest Ranger or Officer, or other Government Official, or by the owner of the property on which the holder of the permit is fishing.
- (f) That the permit be not transferable.

2. Riparian owners shall not require to obtain a permit to fish for trout in the open waters on their own property during the Fishing Season, but such fishing shall be subject to the conditions mentioned in Regulation No. 1 of this Schedule.

3. Any person or persons contravening any of the foregoing Regulations or any of the conditions thereof, shall be liable, on conviction, to a fine not exceeding twenty pounds sterling (£20) for each offence, and in default of payment thereof, to imprisonment, with or without hard labour, for a period not exceeding three months.

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town. Members of Farmers' and Fruit Growers' Associations applying for same through the Secretaries of these Associations are supplied free of charge.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V of *Agricultural Journal*.

Artificial Grasses and Fodder for Stock; Ensilage; Treatment of Cereal and other Crops; Viticulture and Wine Making; Forestry; Locusts and their Destruction; Possible New Industries for Cape Farmers; Stock Farming; Dairying; Fruit Culture (6d.)

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Brak Land in Relation to Irrigation and Drainage (1d.); The Velvet Bean (1d.); Potato Disease (1d.); Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d.); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (3d.); The Salt Bushes (1d.); Tobacco Culture by P. Boruensisza (1d.); The Cultivation of Tobacco in the Colony by K. Schenck (3d.); Tobacco Wilt in Kat River Valley (1d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d.); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); †Dairy and its products by D. Hutchison (2d.); *Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Cabbage Aphis (1d.); Codling Moth in Madeira Fruit (1d.); *Codling Moth (1d.); Fruit Fly (1d.); Fumigation Supplies (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d.); *Peach Yellows (1d.); Pear Slug, Paris Green (1d.); Remedy for Mestwurmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.); Scale Insects on Ornamental Trees and Plants (1d.); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d.); Fumigation under Box Covers (1d.); The House Fly (1d.); New Oak Tree Pest (1d.); Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.); Another Introduced Scale Pest (1d.); Washes for Red Scale (1d.); Fruit Fly: Peach Fly (1d.); Lime-Sulphur-Salt Wash for Scale Insect (1d.); The Fruit Moth (1d.); Fusicladium of the Apple and Pear (1d.); Mealie Stalk Borer (3d.).—*coloured plate*. Cleaning up Nursery (1d.); Natural Enemies of the Fruit Fly: Report on Investigations in Brazil (1d.); Locust Birds and Locust Poison (1d.); The Brazil Fruit Fly Parasites (1d.); Cyanide Gas Remedy for Scale Insects (3d.); Arsenate of Lead (1d.)

Forestry.

British National Forestry (1d.); Botanical Observations on Forests in Eastern Pondoland (1d.); †Elementary Principles of Sylviculture or Woodcraft (1d.). National Forests (1d.); Indigenous Timbers of the Cape (1d.); Misuse of Coal and the Uses of Forests (1d.); Tree Planting for Timber and Fuel (1d.); Tree Planting for Farmers (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Fisheries.

Trout and Carp Breeding and Stocking of Streams (1d.); *Methods of Preserving Fish by Smoking (1d.); Portable Floating Hatching Box for Trout Ova (1d.); The Protection of Trout (1d.); The Ocean and its Resources (1d.)

Horticulture

Fruit Culture in the Gamtoos River Valley (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (6d.); The Olive at the Cape (2d); Tomatoes and Fruit for Export (1d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.); *Fruit from Orchard to Buyer (1d) Netting for Fruit Trees (1d.); Fruit Culture in Argentina (1d.); Vegetables for Exhibition (1d.) Chrysanthemum Rust (1d.)

Veterinary and Animal Industry,

*Anthrax, Charbon, Miltzbrand or Miltziekte (1d.); *Heartwater (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d.); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstock's Report on Inoculation for Rinderpest (1d.); *Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.); *Sheep and Wool (1d.); The Eye and its Diseases (1d.); Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhoea in Calves (1d.); Persian Sheep and Heartwater (1d.); Poisoning of Stock (1d.); Retention of the Fœtal Membrane, or Afterbirth in Cows (1d.); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Tuberculosis and the Use of Tuberculin (1d.); African Coast Fever with Description of Dipping Tank (3d.); *Rinderpest in South Africa (3d) by D. Hutcheson; *Fluke or Slak in Liver of Sheep (3d.)—*coloured plate*; *Anthrax or Miltziekte and Quarter Evil or Sponsziekte (1d.); Osteo Porosis (3d.—*coloured plates*); *Glanders (3d.)—*coloured plate*; *Animal Castration (1d.); *Preventive Inoculation for Redwater (1d.); *Abortion in Cattle (1d.); Treatment for Worms in Domestic Animals (1d.); *Lungsickness of Cattle, Contagious Pleuro-Pneumonia, or Pleuro-Pneumonia-Bovum-Contagiosa (1d.); *Swine Fever, Hog Cholera or Pig Typhoid (3d.)—*coloured plates*; Castration of Females and Animals other than the Horse (1d.); Poisoning of Horses by *Ornithogalum Thyrsoides* or Chinkerinchee (*coloured plate*) (3d.); Diseases of the Horse and their Treatment (1s.); Horse Sickness by D. Hutcheson (2d.); Ticks and African Coast Fever (1d.); Cirrhosis of the Liver in Stock (1d.); Liver Disease among Calves (3d.); The Arsenite of Soda Dipping Mixture (1d.); *Lampas.

Viticulture.

†Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d.); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d.); Manufacture of Dry Wines in Hot Countries (3d.)

Miscellaneous.

Game Seasons (3d.); Land Laws of Cape Colony (1d.); †Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c. 1d.); Bars in Ostrich Feathers (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

R. MÜLLER, 77, STRAND STREET, CAPE TOWN,

Pays **HIGHEST** prices for:—

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MOHAIR, SKINS, HIDES,
and other PRODUCE.**

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(One Door above Loop Street.)

THE PRODUCE MARKET.

CAPE TOWN.

Mr. R. Müller, of Strand Street, reports for the month ending October 20 :—

Ostrich Feathers.—The next London Sales closed about a fortnight ago, with good competition. Wing feathers were from 10 to 15 per cent. higher; best quality Blacks and Drabs about 5 per cent. higher, while Byocks, Spadonas and Tails were from 5 to 10 per cent. lower. It must be borne in mind that the trade is keen on good quality and broad feathers, while common quality is taken only at reduced prices.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
Super Primes	11	0	0	35	0	0	Floss	0	5	0	1	10	0
Firsts, Ordinary							Long Drabs	2	10	0	4	10	0
to Super	7	10	0	10	10	0	Medium Drabs	1	5	0	2	0	0
Seconds	5	0	0	7	10	0	Short to Medium	0	10	0	1	10	0
Thirds	3	10	0	4	10	0	Floss	0	2	6	1	10	0
Femina (super)	7	10	0	10	0	0	White Tails	1	15	0	3	0	0
Femina, Seconds							Coloured Tails	0	10	0	1	15	0
to Firsts	4	10	0	6	10	0	Chicks	0	1	0	0	2	0
Byocks (fancy)	5	0	0	7	10	0	Spadonas	2	10	0	4	0	0
Long Blacks	4	10	0	7	10	0	Inferior Black &						
Medium Blacks	2	10	0	3	10	0	Drabs, Short						
Short to Medium	0	10	0	2	10	0	to Long	0	0	6	1	10	0

Wool.—Since my last report, wools have arrived more freely, and a considerable quantity has changed hands. Light conditioned clips of Combing Grease find a ready sale, while wasty and earthy lots are difficult to move. For all good quality wool, prices are unchanged, but for common and heavy descriptions, lower prices have to be accepted. Advices from England and the Continent shew that our market is higher than it should be, and it is to be expected that we shall see lower prices before long. With large expected arrivals in the near future, the Trade in Europe is playing a waiting game. Super Karoos realised from 6½d. to 7½d. Molmesburys from 7 to 8½d.; Super Light Roggeveld and Grassvelds from 7½d. to 8½d., one special clip fetching 9½d. Darlings realised up to 8½d.

	s.	d.	s.	d.		s.	d.	s.	d.
Super Long Grass Veld					Short and Inferior	0	4	0	4½
Wool	0	8	0	9½	Wool for Washing	0	4½	0	6
Super Long Karoo Veld					Snow-white Super to Extra	1	7	1	0
Wool	0	6½	0	7½	„ Ordinary	1	1	1	6
Medium Karoo Veld Wool	0	5	0	5½	Fleece Washed	0	0	0	9½

Mohair.—There is little doing in Summer Firsts and Kids. Transactions are mostly confined to Winter, for which 1s. has been paid, and from 1s. 2½d. for Winter Kids. The news from Home shews that trade is quiet and sales are restricted.

	s.	d.	s.	d.		s.	d.	s.	d.
Mohair, Firsts, Summer	1	1	1	3½	Mohair Winter	0	10½	1	0
„ Kids	1	3	1	7	„ „ Kids	1	0	1	3
„ Seconds	0	6½	0	9½					

Hides and Skins.—There is a keen demand for all classes of Hides, and prices are about ½d. to ¾d. higher. Skins are unchanged, all classes being eagerly enquired for.

PORT ELIZABETH.

Messrs. J. Daverin and Co., report under date October 19 :—

Ostrich Feathers.—A fair demand continues out of hand, and some sales have been made at extreme prices.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
Primes: Extra super				Special Prices.			Blacks: Long..	3	10	0	6	10	0
Good to super	12	0	0	14	0	0	Medium ..	1	15	0	3	0	0
Whites: Firsts	9	0	0	12	0	0	Short ..	0	10	0	1	0	0
Seconds ..	6	0	0	8	0	0	Wirey ..	0	1	0	0	1	0
Thirds ..	3	0	0	4	10	0	Floss ..	0	6	0	1	15	0
Feminas:							Drabs: Long ..	1	15	0	3	0	0
Super ..	10	0	0	14	0	0	Medium ..	0	12	6	1	0	0
Firsts ..	5	10	0	9	0	0	Short ..	0	2	6	0	6	0
Seconds ..	4	0	0	5	0	0	Wirey ..	0	0	6	0	1	0
Thirds ..	2	10	0	3	0	0	Floss ..	0	6	0	1	15	0
Greys ..	4	10	0	6	10	0	Spadonas:						
Fancy ..	5	10	0	8	10	0	Light ..	2	0	0	5	10	0
Tails' White ..	1	10	0	4	0	0	Dark ..	0	12	6	1	15	0
Light ..	0	17	6	3	0	0	Chicks ..	0	0	3	0	1	6
Coloured & Dark	0	5	0	1	2	6							

Wool.—There is nothing new to report in this market. A keen demand exists for all well-conditioned clips of new season's Grease, for which satisfactory prices are obtainable; but for heavy and wasty lots there is little or no demand, and to effect sales low prices have to be accepted.

Snowwhite Extra							Grease, Short, faulty						
Superior ..	19½d	20d					and wasty ..	5d	5½d				
Snowwhite Superior ..	17½d	19d					Grease, Coarse and						
Do Good to Superior	16½d	17d					Coloured ..	4½d	4¾d				
Do Inferior Faulty	16d	16½d					Scoured, Coarse and						
Grease, Super Long, well-							Coloured ..	6½d	12d				
conditioned, Grass-							Basuto Grease, short..	6d	6½d				
veld grown (special clips)	8½d	9d					O. R. C. Grassveld						
Grease, Super Long, well-							Grease, long and						
conditioned, Grass-							well - conditioned						
veld grown ..	6½d	7½d					(special clips) ..	6½d	7d				
Grease, Super Long, well-							O. R. C. Grassveld						
conditioned, Karoo							Grease, long and						
grown (special clips)	7d	7½d					well-conditioned ..	5½d	6½d				
Grease, Super Long, well							O.R.C. medium grown,						
conditioned							light, with little						
Karoo grown ..	6d	6½d					fault ..	6d	6½d				
Grease, Super Long, well							O.R.C. short, faulty						
conditioned, Mixed Veld	5½d	7d					and wasty ..	5d	5½d				
Grease, Light, faultless,							O.R.C. Karoo grown,						
medium, Grassveld							long and well-						
grown..	5½d	6½d					conditioned ..	5½d	6½d				
Grease, Light, faultless,							O.R.C. medium grown,						
Karoo medium grown	5½d	6d					light, with little						
Grease, Light, faultless,							fault ..	5d	6d				
short Karoo grown	5½d						O.R.C. short, faulty						
							and wasty ..	4½d	5d				

Mohair.—We regret to report that there is no improvement in this market. No business has been done in Summer Firsts or Kids, and the orders for Winter at 12d. have been filled, and the best price now obtainable for good lots is 11½d. There is some enquiry for good Winter Kids at 11½d., but to get this price the hair must be well grown.

Super Kids ..	1s	6½d	1s	7d	Mixed O.R.C. Hair								
Ordinary Kids ..	1s	4d	1s	5d	(average) ..	0s	11½d	1s	0½d				
Superior Firsts, special					Do. Very Mixed ..	0s	10½d	0s	11d				
clips ..	1s	3½d	1s	3½d	Seconds and Grey ..	0s	8d	0s	9d				
Ordinary Firsts ..	1s	3d	1s	3½d	Thirds ..	0s	6¾d	0s	7d				
Short Firsts ..	1s	1d	1s	1½d	Winter Kids ..	1s	2d	1s	2½d				
Superfine Long Blue,					Do. Hair ..	0s	11¾d	0s	11¾d				
O.R.C. Hair ..	1s	2d	1s	3d									

Skins continue in active demand. Sheepskins sold in bundles at 6½d. per lb.; Pelts at 5½d.; Capes, 2s. 2d.; damaged, 7d. each; Angoras, 8½d.; Shorn, 5½d. damaged, 3½d.; Goat, 12½d.; damaged, 5½d. per lb.; Springbok, 8d. each.

Hides.—Sundried Hides sold this week at 9d., and damaged at 6d.; Drysalted 8d., damaged 5½d., and Thirds 3½d.

Horns.—Parcels sold all round at 3½d. each.

BREEDERS' DIRECTORY.

Notices under this heading are inserted at the rate of one penny per word per issue; minimum charge 2s. 6d. Payment must accompany order. Six consecutive insertions 10% discount; twelve 15% discount. Cheques and P.O.O. to be made payable to the Accounting Officer, Department of Agriculture, Cape Town.

HORSES.

Hugh A. Wyndham, Kromdraai Stud, near Standerton, Transvaal. Stud Stallions, Season 1906-1907. Broxtou, d.b.h., 15-8. He is very well bred, being by Ayrshire, winner of the Derby, out of Farewell, winner of the 1,000 guineas, by Doncaster, winner of the Derby, out of Lily Agnes, dam of Ormonde, winner of the Derby, her dam Polly Agnes by the Cure—Miss Agnes by Irish Birdcatcher. Thoroughbred mares, £10 10s.; limited number of approved mares, £5 5s.

Narhillah, ch. h., 15 hands, by Batiol, out of Little Nell, by Lammormoor. He won several steeplechases in England, and ran seventh in the Grand National in 1904. Thoroughbred mares, £7 7s.; approved mares, £3 3s.

CATTLE.

SHORTHORNS.

Turpin, Geo. W., WATERFORD, KUBUSIE STATION, CAPE COLONY. Breeder of Pedigree Lincoln Red Shorthorn cattle. Young bulls always for sale.

JERSEYS.

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Pure Frieslands. Enquire for cows, young bulls, and heifers. Oldest pure herd in Eastern Province. Grand milkers. Prize stock. Also, Colonial Rambouillet Flock Rams, limited number.—F. F. WIENAND, Bellevue, Bedford, C.C.

R. Cross, HILLSIDE, P.O. BOLOTWA. Will have high-class Friesland bulls for sale from February next. Herd may be seen by appointment. Bulls from Imported and Colonial Cows.

Cattle—continued.

DEVONS.

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SHEEP.

MERINOES.

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R. Pell Edmonds, RIPLEMEAD, KUBUSIE. Breeder of Pure-bred Pedigree Merino Sheep and Pedigree Black Welsh Cattle. —For particulars, see page xxxviii.

PIGS.

Arthur Jones, GREEN BUSH, PORT ELIZABETH. Breeder of Berkshire and Large White Yorkshire Pigs from Imported Pedigree strains; Winners of 14 First, 6 Second Prizes and 1 H. C. at Grahamstown and Port Elizabeth Shows of 1905 and 1906.

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H. Vermaak, The Pines, Maraisburg, Cape Colony, has on hand and for sale at very reasonable prices, **PURE-BRED FRIESLAND BULLS** and **PURE-BRED MERINO RAMS** of the **RAMBOUILLET** breed.

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PASPALUM GRASS PLANTS.—Quotations for plants, in bags free on rail Stellenbosch (keep moist long distance). See *Agricultural Journal*, May, 1906, page 622, or from **A. C. BULLER**, Dwarsriviershoek, Stellenbosch.

W. Bullen, P.O. Box 1354, Cape Town, Breeder and Importer of Game, Houdans, Leghorns, Orpingtons, Wyandottes, Ducks, Geese, Homing and Fancy Pigeons at lowest prices (all risk taken).

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S. Montague Gadd, SPRINGFIELD, TAFELBERG. Orders booked for young rams, from Stud-book Ewes and for Ostrich Chicks from the best strains in the country.

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PRIZE and UTILITY POULTRY of the BEST ENGLISH and AMERICAN STRAINS.—**WHITE WYANDOTTES**—**PARTRIDGE WYANDOTTES**—**SILVER-PENCILLED WYANDOTTES**—**BARRED PLYMOUTH ROCKS**—**WHITE LEGHORNS**—**BROWN LEGHORNS**—**BUFF LEGHORNS**—**WHITE LA BRESSE.** Stock and SETTINGS OF EGGS FOR SALE. Correspondence invited.—**S. SMITH**, Talana, Wellington Avenue, Wynberg.

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THE Agricultural Journal

OF THE CAPE OF GOOD HOPE.

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NOTES.

Important Notice.

With the next issue of the *Agricultural Journal* the new system of gratis distribution comes into force. The new lists are coming in and include a much larger number of farmers than there were on the old lists which shews conclusively that the revision is a success. It has now to be borne in mind that *all farmers* in the Cape Colony are entitled to a free issue. All that is necessary is to apply to the Resident Magistrate stating name, full postal address and occupation, also whether the English or Dutch issue is desired. Those who have not sent in their names should not delay or they will miss the January issue.

With the January issue the suggestion put forward during the last session of Parliament will be given effect to, and the two issues—English and Dutch—published as nearly simultaneously as possible. To do this the date of publication will be altered to the 15th of each month for both issues in order to give the printers time to cope with the work.

Wheat Breeding and Rust Resistance

Mr. W. T. Saxton B.A., in this issue, gives an account of the practical application to farming, of some of the fundamental laws of nature connected with that obscure, but captivating study, heredity. The story of the discovery and rediscovery of the Mendelian laws is itself interesting, but their connection with such a vital question as the production of rust-resistant wheats renders the subject one of the first importance to modern agriculture. For several years past the production of new varieties of cereals has been occupying the attention of seedsmen and scientists in Europe America and Australia with gratifying success. At first for lack of realisation of the facts explained in the article, it took many years to fix a type and much unnecessary effort was expended thereon. Even now, though theoretically simple, in practice the work of cross fertilisation and subsequent selection is an intricate and laborious task.

Incidentally it may be mentioned that work along these lines by the Agricultural Department is now in its second season; but that it is too soon yet to make any announcements in the matter, anyone who has perused Mr. Saxton's paper will readily comprehend. The need and urgency of such work must at once be admitted especially in view of the fact that the most rust resistant Australian varieties produced by these methods such as Bobs, Jonathan, Ghuyas and

Budd's Early, regarded as rust free in the land of their origin are not immune (although resistant) in the Cape Colony. Moreover Reitti wheat, resistant as it has shewn itself to be, may not continue so indefinitely, indeed very recently a specimen of Rietti wheat reached the Department completely covered with rust to a degree never previously observed in this sort. Although it had reached the full ear and presumably would ripen to grain, still the return must have been materially reduced. This single stool, in itself unimportant, has an ominous significance which emphasises the necessity of continuing vigilantly the search for that almost unattainable ideal, a rust proof wheat.

Cape Fruit in the United States.

Messrs. Peycke & Co., of Port Elizabeth write:—By this mail we received a communication from the Peycke Bros. Com. Co., Kansas City, Mo., United States, which we believe will be of some interest to fruit producers and exporters in this country and which reads as follows:—“We received a few consignments of South African plums and peaches last December and January from New York importers, the goods usually arrived in perfect order and kept well, but the price after paying express charges from New York to Kansas City makes the fruit cost so much, that the demand is quite limited. We sold boxes containing twenty one plums or peaches at from \$2 to \$2.50, and the retailer could not very well afford to sell such fruit at less than 20cts apiece, rather too high to create a large consumption.” The above particulars no doubt speak well for the fruit grown in the Cape Colony as also for the packing, and prove that a market for South African fruit can be made even in the far west of the States.

Dry Farming.

In the correspondence pages we publish an interesting communication from Dr. Steyn, summarising a magazine article on what has come to be known as the “Campbell Method of Dry Farming.” While the underlying principles of the method are undoubtedly sound, we may point out that there are difficulties in the way of learning farming methods from a magazine article. And the system is not really new to this country, but has been practised in many parts for years past. The whole of the viticultural and fruit industry of the Western Province is, practically speaking, based on it; while in the Eastern Province it is also largely in use for the mealie crops where the constant hoeing of the natives takes the place of cultivation and by keeping the surface soil in a condition of mulch enables large crops to be raised on unirrigated lands. The further adaptation of the principle is undoubtedly desirable in this country, but it must be done with care, as a slavish adherence to rules given for a totally different set of condition to ours would probably end in disappointment.

Lamziekte and Ticks.

Mr. D. Hutcheon, Director of Agriculture, writes:—"I have carefully noted Messrs. Lanham Brothers' communications on lamziekte in cattle, in the November issue of the *Agricultural Journal*. From the history of the outbreak of the disease amongst their cattle, and also amongst those of Mr. J. Peach, there are reasonable grounds for arriving at the conclusion that the disease which is prevalent amongst their cattle is infectious, or at least it is capable of being carried to a farm or herd of cattle by an affected animal. Unfortunately, Messrs. Lanham do not give any description of the symptoms or *post-mortem* lesions which they have observed in the affected cattle, to enable us to form any opinion of its nature, or whether it in any way differs from what is generally recognized as typical lamziekte. I may mention, however, that their experience of the spread of the disease does not correspond with outbreaks of "Lamziekte," on many other farms. For example, during my recent visit to Griqualand West and Bechuanaland, I was on one farm where the disease appeared amongst the milch cows two years ago, and a large percentage of them died. The herd were running in a large camp by themselves, and when the disease continued to prevail amongst the cows, notwithstanding every effort to prevent it, the owner at last removed the whole herd from that camp, and put sheep into it. The disease ceased almost immediately after the removal of the cows to another camp, and there has not been a single case amongst them during the last year, nor amongst the other cattle with which they mixed. Now if the disease which prevailed amongst this farmer's milch cows, which was looked upon as lamziekte, were communicated by ticks, the affected herd would have carried the pathogenic ticks with them to the other camps, and to the other cattle.

"There was another large farm which I visited, on which there was a camp on which no stock had grazed for nearly eight years due to the absence of water. After water was provided a large herd of healthy cattle was put into this camp, but they had not been in it more than a month, when they began to die from a disease which was looked upon as lamziekte. As the disease persisted, and the mortality was high, the cattle were removed from the camp and placed in another. The disease ceased immediately after their removal, and has not re-appeared in that herd. Now there could not have been any pathogenic ticks in that camp previous to that herd of cattle being placed in it, as there was no live stock of any kind upon which they could have fed and imbibed the infection. Neither did the cattle carry any infection away with them from the camp, although four of the cattle were actually sick when the herd was removed. In both these cases, the history points to something in the vegetation of the camp, yet in the first

case that something does not affect sheep, and in the second case it does not affect horses. All information relating to this "lamziekte" is however, of value, and is deserving of careful consideration, but the striking differences in the history and characteristics of the different outbreaks clearly point to one conclusion, viz., that there are several diseases of cattle included in the term lamziekte, which I trust that our experiments combined with personal examination on the spot will be able to differentiate and define.

"The tick referred to by Messrs. Lanham which is believed to cause paralysis in small stock is met with over large areas of the Colony in many of which we do not meet with cases of lamziekte in cattle. The comparison which Messrs. Lanham draw between the action of quinine in malarial fever, and that of bonemeal on lamziekte is not very apparent. Quinine is a germicide, and exercises a direct action on the malarial organism in the blood, but there is nothing germicidal in bonemeal. I am glad however to find that Messrs. Lanham admit that it exercises a beneficial effect on the disease which affects his cattle."

Preventive Treatment for Lamziekte.

In reply to a correspondent Mr. D. Hutcheon, Director of Agriculture wrote:—"I have read your letter carefully and I am strongly of opinion that the cases of congestion and inflammation of the fourth stomach which you describe must arise from some irritant and poisonous plant which the animals eat. We meet with such cases in many districts of the Colony where no such disease as lamziekte is known. It is quite possible, however, that the plant which produces this irritant and poisonous effect does so only under certain conditions, or at a certain stage of its growth. At any rate, the irritant must be something which is capable of producing acute and rapidly fatal effects, to carry off the animals in the manner which you describe.

"While expressing this opinion of the cases which you describe, I must mention that in cattle there are several forms of disease in which there is serious disturbance of the brain and nervous centres, accompanied by varying degrees of paralysis. For example, in stabled animals, which are well fed on forage, bran, etc., a cow will contract congestion of the liver and derangement of the digestive organs, and manifest the following symptoms:—She will be observed to be dull and eating sparingly and to stagger slightly in her walk, as if weak about the loins. By-and-bye brain disturbance appears, the cow goes down, becomes rapidly worse, and unless relieved will most likely die completely comatose within forty-eight hours. If these cases are observed in time, and properly diagnosed, they can usually be relieved by giving at once a large

dose of Calomel—60 to 80 grains, to a big cow or ox—followed in from 8 to 12 hours by a good dose of Epsom or Glaubers salts. The history and character of these cases plainly indicate that the serious disturbance of the nervous centres, followed by paralysis, coma and death, are not caused by any particular irritant poison which the cow takes in with her food or water, but to some poison which is developed in the liver and digestive canal, due mainly to the liver failing to discharge its proper functions. I have frequently seen the comatose symptoms pass off within a few hours after the dose of calomel was administered.

“Dairymen are, doubtless, familiar with that disease of stabled milch cows, called ‘milk-fever’ or ‘Dropping after calving.’ In these cases the nervous disturbance, staggering gait, rapidly followed by paralysis, coma and death are not due to anything which the cow takes in with her food or water, but to some irritant poison which is developed within the animal body. I am aware that the exact pathology of milk-fever has not been worked out yet, but if we are to judge by the success which has attended the modern method of treating the udder in this disease, it would naturally follow that the poison is in some way developed within that important gland.

“I do not, however, quote these cases with the object of shewing that they closely resemble the cases which you describe, and that similar treatment will be effective; I merely want to shew that there are a variety of irritants or poisons which cause serious disturbance to the nervous centres in cattle accompanied by varying degrees of paralysis, coma and death.

“With respect to preventive remedies, you ask whether an aperient dose administered at intervals would have a beneficial effect. If the cause of the trouble is something which the animal eats, one would naturally expect that a purgative would do good by clearing out the irritating and poisonous substance from the digestive tract. I am afraid, however, that unless these aperient doses were given at very short intervals—which would be a serious undertaking in a large herd—they would not act effectively as a preventive of the disease. These irritant and poisonous plants, as a rule, produce their physiological effects very rapidly after they enter the fourth stomach in which they are digested. I am persuaded, however, that an active purgative if we can only hit upon the right one, would act beneficially as a curative agent, even in your form of disease of the stomach and liver, if administered in time.

“If, on the other hand, the cause of the congestion and inflammation of the stomach and congestion of the liver is something

specific—in other words, due to micro-organisms of the *Pasteurella* type, described by Mr. Bowhill, who attributes all such cases which occur along the coast area to an invasion of the digestive canal by these micro-organisms, a germicide may require to be added to the purgative. It is true that in many parts of Griqualand West the conditions are not quite the same as they are along the East Coast. In the latter area Mr. Bowhill considered that the filthy dam water was at least one, if not the main, source of infection, but the disease is prevalent on many farms in Griqualand West where the cattle drink only well-water, free from contamination. But be that as it may. Admitting that it may be due to some pathogenic organisms, which enter the digestive canal, and from that invade the nervous centres, the preventive remedy would require to possess germicidal properties, and be administered very frequently if it is to act as an effective preventive against the action of an agent which is always present. Anything that the cattle would lick would have a great advantage in that respect, and for that reason Stockholm tar is the favourite remedy resorted to by a large number of farmers. Where cattle will lick salt readily, they will, as a rule, take a considerable amount of tar along with it, and with much benefit. My first experience of the beneficial effects of Stockholm tar on the digestive canal of ruminants was during the years 1888, 1889, 1890, and 1891, when I was trying to discover an effective remedy for wireworm in sheep. I found this an effective remedy for wireworm in the stomach, but it requires to be given in much larger doses than is generally administered. The dose for a full-grown sheep should not be less than a tablespoonful. I gave two tablespoonfuls with no apparent ill effects on the sheep. I had the sheep killed 24 hours after being dosed, and I was very pleased with the action of the tar on the mucous lining of the stomach and bowels. Not only were the worms dead, but the mucous membrane of the stomach and small intestines presented a very clean, pink and healthy condition, quite different from the dirty catarrhal condition of the bowels of a sheep which is affected with internal parasites. Cattle can take at least three times the dose of Stockholm tar that a sheep can. If it becomes necessary, therefore, to dose cattle with tar as a preventive of the poisonous action of pathogenic organisms, such as *Pasteurella*, they should receive at least three tablespoonfuls as a dose, and this should be given twice a week. This is assuming, of course, that these pathogenic organisms are always more or less present during certain months of the year. But whether this disease be due to *Pasteurella* or to any other irritant that enters the digestive canal, there can be no difference of opinion with respect to the beneficial effects of Stockholm tar on the digestive organs of ruminants, and I strongly recommend its continued use in a lick for cattle and sheep, where common salt and other saline constituents are required.”

The Analysis of Soils.

Mr. F. H. Barber, in the correspondence this month, puts forward a strong plea for the systematic analysis of the soils of the Colony. This work was started some years ago by the Senior Analyst, but came to an untimely end owing to the absence of funds. The value of such a work cannot be doubted, but if it is to be done at all it must be done for other reasons than those put forward by Mr. Barber. We are afraid our correspondent expects too much from soil analysis. Science can do a great deal to help the farmer, but it cannot do much unless the farmer is prepared to back it up with energetic and intelligent farming. There is no need to labour this point—it will come home soon enough to our farmers once they begin to look to science to supply them with crutches to take the place of healthy limbs. Instead, we will merely quote one of the most recent utterances on the subject by a recognised authority. At the meeting of the British Association for the Advancement of Science, held last year in South Africa, Mr. A. D. Hall, M.A., one of the world authorities on the subject, dealt at some length with this question. He then said: "It has been generally demonstrated that an analysis, physical and chemical alike, of the soil of a particular field taken by itself possesses but little value. The physical analysis will indicate roughly the character of the soil, but very little better than could have been learnt by walking over the soil and digging in it for five minutes; the chemical analysis will disclose any glaring deficiencies, but, as a rule, the analytical figures will be of very indecisive character, and will lead to little information of practical value. This is because the productivity of a given piece of land depends upon a large number of agencies, any one of which may be the limiting factor in the crop yield. We may enumerate, for example, temperature and water supply, both determined by the climate, by the natural physical structure of the soil, and by the modifications in its texture induced by cultivation; there are further the aëration and actual texture of the soil, the initial supply of plant-food of various kinds, and, again the rate at which this last item is rendered available to the plant by bacterial action or by purely physical agencies.

"All these factors interact upon one another, to all of them and not merely to the nutrient constituents does Liebig's law of the minimum apply; so that any one may become the limiting factor and alone determine the yield. It is of no use, for instance, to increase the phosphoric acid contents of a soil, however deficient it may be, if the maximum crop is being grown that is consistent with the water supply, or if the growth of the plant is being limited by insufficient root range, caused by bad texture and the lack of aëration in the soil. However much we may refine our

methods of analysis, we may take it for certain that we shall never be able to deduce *a priori* the productivity of the soil from a consideration of the data supplied by analysis.

“The function, then, of soil analysis is not to make absolute deductions from the results, but by a comparison of the unknown soil under examination with other soils already known, to interpret the divergencies and similarities in the light of previous experience. That a given soil contains one-tenth per cent. of phosphoric acid or one-fiftieth per cent. of the same constituent soluble in a dilute citric acid solution is in itself meaningless information; but it becomes of great value when we know that the normal soils of that particular type contain less than this proportion of phosphoric acid as a rule, and yet shew no particular response to phosphatic manuring.

“What, then, the soil analyst can do is to characterise the type, ascertain its normal structure and composition, and correlate its behaviour under cultivation, its suitability for particular crops, and its response to manuring in various directions. Thus an unknown soil may by analysis be allotted to its known type, deviations from the type can be recognised, and conclusions may be drawn as to the connection of these defects.”

In concluding this valuable and instructive paper, Mr. Hall stated: “There is little hope that science can do anything wholly new for agriculture; acclimatisation, breeding and selection have been the main-stay of farming progress since the beginning of time, just as the action of nitrifying bacteria and of nitrogen fixation by leguminous plants were instinctively apprehended by the earliest farmers of whom we have any record. But with increasing knowledge comes more power, and particularly the possibility of accelerating the rate of progress; agricultural improvements in the past have resulted from the gradual and unorganised accretions of the observation and experience of many men, often of many generations. Now that we are provided by science with guiding hypotheses and by the organisation of experiment with the means of replacing casual opinions by exact knowledge, even the properties of the soil and the character of our farm crops and animals—stubborn facts as they are and deeply grounded in the nature of things—ought to become increasingly plastic in our hands.”

Important to Farmers.

The Commercial Agent of the Agricultural Department requests us to state that those farmers desirous of gaining information as to contracts for supplies, etc., open, can do so on application to him.

FARM AND VELD.

Co-operative Prune Drying.

The prune-growers of Paarl and Stellenbosch have started a movement in favour of co-operating in the treatment and disposal of the prune crop this year. One meeting has been held, and certain steps practically decided upon. Another meeting is called for the 7th inst. (Friday) at 11 a.m., to consider the committee's report on the details and definitely decide on a scheme. To this meeting all growers are invited, and we trust they will attend. The idea is most laudable for many reasons. The first is, of course, the desirability of turning out all our dried fruits of a uniform quality, well treated and well graded. The next is in the interest of the industry itself to be able to place specified quantities on the markets, and thus guarantee supplies. The last meeting—representing something like 200 tons of dried prunes—came to the conclusion that the scheme was feasible, and we can only wish it every success. Mr. Arton, of Drakenstein, has kindly offered the use of the necessary plant free for the first year, and hopes are entertained that suitable buildings will be available at nominal charges, so that the scheme starts well. The committee will present the details at the next meeting, with a set of draft regulations. The idea is for growers first to dip and dry their prunes under fairly simple regulations, and then to send them to the central building to be graded, sweated, re-dipped, packed, and disposed of. In no way is it intended to enter into competition with the merchants, but rather to make use of established systems for distribution as far as possible, and confine their efforts to the wholesale business entirely. The scheme looks well, and certainly deserves success.

The Castration of Ostriches.—Favourable Experiences.

Mr. Walter J. Edwards, of Klipfontein, Graaff-Reinet, writes:—"In the September number I notice a paper read by Mr. Elley on "Castration of Ostriches" and his method of doing it. Of course we farmers cannot go in for chloroforming them, as it requires some experience to administer. A good many years ago, while Mr. Walter Murray of Roodebloom, Graaff-Reinet, was travelling about in the interests of Cooper's Dip Powder I asked him to shew me how to operate on the cock ostrich. He shewed me how to do one, which unfortunately died. I then operated on

two, one a very vicious bird, and was successful. I kept them for years, and they were as docile as one could wish, and used to run about the homestead. Their condition was always of the very best. The feathers as far as I could judge, did not improve but they did not deteriorate in the least.

"This year I operated on five cocks. All of these were very vicious and used to chase all boys, carts, and men on horseback. My method was to get them into a shed, starve them for 48 hours, and then with two good boys to hold them up against the wall, I did the operation, (of course with a bag over the head). My hand being large the cavity was large in proportion, but I was careful to stitch with sail twine, each stitch being well knotted. In one case the knotting was carelessly done and the entrails came out while the bird was in the veld. This one died, but the rest are well and as docile as lambs. One of the five birds was very vicious, and remained so for a month or two after the operation, but now the four can be seen anyday around my homestead and are acting as scavengers picking up all sorts of peels or refuse from the kitchen even to swallowing chickens wholesale, when they get a chance. As to their plumage, I can see no difference. The blacks have the same lustre and the whites as well and I cannot understand Mr. P. M. Southey saying the plumage is worse, and the birds as vicious as ever. My experience is just the opposite.

"I have never operated on young birds so cannot say if they in changing colour will remain a brownish black. I am writing this thinking the subject may be of interest to you and others."

Locust Destruction—Arsenite of Soda.

The Resident Magistrate of Steynsburg "reports that the farmers there formed a locust board lately, and unanimously resolved to do everything in their power to cope with the pest. Upwards of 600 lbs. of Arsenite of Soda have been issued to various farmers who had up to that time been using ordinary watering cans, which are reported to have acted admirably. Spray pumps have since been used. Several of the influential farmers who availed themselves of the arsenite of soda report that it acts excellently, and they have had most favourable results. So far from any loss resulting, they state that ducks which had eaten the sprayed locusts appeared to feel no ill effects whatever.

The application of the poison with a watering can is only justifiable where and when pumps and proper nozzles are not procurable, and when a can has to be used care should be taken to avoid applying an excessive amount. At the best far more of the liquid is unavoidably used with the can than with the pump, and

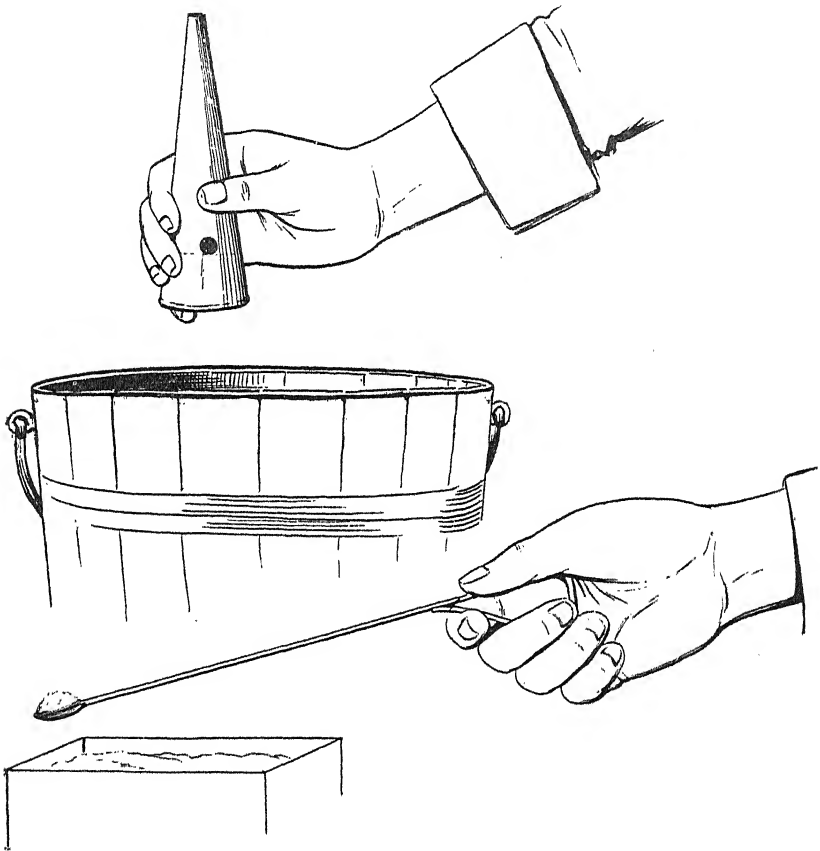
correspondingly greater damage is done to the vegetation. When properly applied with the pump, comparatively little of the solution falls on to the ground, a large part of it remaining on the grass or bushes, or on the bodies of the locusts, where it will be found and eaten by the pest. The poison is entirely soluble, and what falls on the ground washes into the soil and affects the roots of the vegetation more or less injuriously, according to the amount present. The vast excess applied when a can is used also increases what risk there is of affecting stock. Arsenic is in the solution at ten to twenty times the strength it is in the insoluble preparations used for destroying caterpillars on the trees, and from this fact it may be inferred that a little goes a long way even in destroying locusts. It may be mentioned that when the use of arsenic for locust destruction first began in Natal, pumps were unobtainable and, in fact, practically unknown; the solution was simply spattered over plants by means of crude brushes.—C. P. L.

A Suggestion.

The Civil Commissioner of Kimberley, writing on the 20th ult. to the Government Entomologist, says:—"I wish to offer a few remarks on the subject of locust destruction. In the Colony and, I think, my remarks will apply to the Orange River Colony and the Transvaal, every farmer has his flock of sheep and goats herded by a native, and as a rule most farmers have their horses and cattle rounded up daily also by a native. These natives are naturally observant, and usually report each day anything unusual they may have observed in the veld, and the visits by locusts to any part of the veld are always reported to the farmer. When the locusts deposit eggs—usually in a sandy part of the farm—the fact is also reported. The next rain after the eggs are deposited usually helps the hatching of the eggs, and the locusts make their appearance in the shape of little black insects resembling, to a small extent, flies. These are all observed by the native herd and duly reported to the master. But even if they do not voluntarily report, they can surely be ordered to do so.

"Now my idea is that when the locusts are hatched, is the time to destroy them. Very little trouble is required to destroy them then. I believe a bottle of paraffine poured over them at that stage and set alight would destroy millions, or even if they were covered over with soil, or beaten down with spades, or sprayed with soap mixture or some form of arsenic, efficient destruction could be carried out. It is useless—and I may almost say iniquitous—to wait until they attain the hopping or voetsganger stage, and, worse still, the flying stage, before steps are taken for their destruction. There is a great deal of nonsense talked about locusts coming from the Kalahari, and it being useless to destroy them. Some may,

and undoubtedly do, come from the Kalahari, but the majority of swarms are hatched within our own borders, and I maintain that these can be destroyed, with the exception perhaps of those hatched in the very large farms of 20,000 or 30,000 morgen in the North-Western divisions of the Colony. I do not write with any idea or wish to set people by the ears, but in the hope that an honest endeavour will be made to cope with this plague in the manner I have indicated."



Simple Sheep Dosing Appliances.

Mr. H. C. McLachlan, of O'Reillysfontein, Vryburg, submits a couple of simple devices for dosing sheep, drawings of which are shewn herewith. The drawings explain themselves fairly well to those used to handling sheep and dosing them for worms and other diseases, but for the benefit of the uninitiated we may state that the cone is a device for administering liquids. The particular use

to which it has been put has been in dosing for worms. It is made of tin closed at the broad end and open at the narrow end, thus forming a funnel. Its dimensions are $6\frac{1}{2}$ in. long by $1\frac{1}{2}$ in. wide at the broad end, tapering to $\frac{3}{8}$ ths of an inch at the narrow end. The hole shewn just below the thumb is $\frac{1}{2}$ an inch in diameter. The method of using is simplicity itself. A sufficient quantity of the mixture is placed in a tub or bucket, as shewn. The operator sits beside it, and the sheep are passed to him one at a time by his "boys" or other help. The cone is dipped into the mixture till it is full to the hole. The thumb is then placed on the hole, and the dose poured down the sheep's throat as easily as through a funnel. In dosing it is only necessary to release the thumb from the hole slightly when the cone is inserted in the animal's mouth. The hole being placed one inch from the bottom, a dose of about one fluid ounce is secured. Of course the principle could be extended or modified to any degree.

The second device is practically a miniature spoon. The bowl is made of lead shaped sufficiently to hold a given or approximate quantity of powder. The handle is ordinary iron wire, and is about $8\frac{1}{2}$ inches long. This Mr. McLachlan uses for dosing his sheep with raw Cooper's powder for geelziekte, without any admixture, and speaks of it as very successful. The sheep are handled as above, with the exception that the spoon or ladle, when filled with the powder, is placed well back in the animal's mouth, and by a sharp turn the powder is deposited on the back of the tongue. These simple devices must save a good deal of labour in addition to removing the element of inaccuracy so common in dosing large flocks.

Caustic Soda and Sulphur as a Sheep Dip.

Numerous enquiries have been made recently regarding the suitability of caustic soda to replace lime in the well-known lime and sulphur dip for sheep and goats. In order to arrive at an accurate knowledge of the subject, the Director of Agriculture (Mr. D. Hutcheon) requested Mr. W. Robertson, M.R.C.V.S., to carry out some experiments. Mr. Robertson reports that he prepared dips of various strengths, employing caustic soda in place of lime. The first he prepared as under:—Sulphur 25 lbs., caustic soda 18 lbs., water 100 gals. Boiled for $1\frac{1}{2}$ hours in 50 gals. water. This made a perfect compound free of sediment, and apparently innocuous to skin or fleece. The sheep were immersed for two minutes.

The second experimental mixture consisted of sulphur 25 lbs., caustic soda 8 lbs., water 100 gals.; boiled for $1\frac{1}{2}$ hours in 50 gals.

of water. Two sheep and a goat were dipped for two minutes without bad effect to either skin or wool. There was a slight sediment of unaltered sulphur, and the mixture was dark in colour.

The third experimental mixture was sulphur 25 lbs., caustic soda 4 lbs., water 100 gals., boiled for $1\frac{1}{2}$ hours in 50 gals. water. Two sheep and a goat were dipped without bad effects. This dip contained a large amount of unaltered sulphur. The percentage of lime to sulphur in the Government dip is as three to four, and using these figures, Mr. Robertson found that by employing caustic soda a much less quantity produced a perfect chemical compound when boiled with sulphur. One of caustic soda will easily combine with three of sulphur—i.e., 1 to 4. The employment of caustic alkali, however, in place of lime, materially increases the cost of the dip, as caustic soda costs $7\frac{1}{2}$ d. per lb. wholesale.

The Mixture Cold.—Experiments were then tried with the object of seeing if the mixture could be prepared without boiling. The first attempt was made with 25 lbs. of sulphur, 18 lbs. of caustic soda and 100 gals. of water. The soda was dissolved in 20 gals. of water, and the sulphur then added. In 40 hours a fair dip was produced which, on mixing with 80 gals. of water, shewed traces of unaltered sulphur. Three sheep and two goats nearly died as a result of immersion in this bath. The hands of the workers were much excoriated and blistered after ten minutes work, the tips of the fingers used in holding the wool being quite raw. The fleeces of the sheep became quite hard and caked, and the goats were extremely stiff for a few days.

Further dips were prepared in the cold, reducing the amount of caustic soda, sulphur 25lbs., caustic soda 9lbs and water 100 gallons were mixed and left for 40 hours. Fully 7 lbs of sulphur was quite unaltered. This dip caused the hand to smart and tingle when immersed for a few minutes. Mr. Robertson did not dip sheep in this, as the proportion of sulphur unacted upon was so great. The effect upon the hand he considered a sufficient test of its unsuitability.

Sulphur 25lbs., caustic soda 13lbs and water 100 gallons, left for 40 hours was next tried. A large amount of sulphur was unacted upon and unaltered and the dip was too strong to employ for sheep. The hand was affected after an immersion of a minute and the skin was blistered after three minutes.

Spots on Melons.

In the Kew Bulletin, No. 6, 1906, a report appears on some spotted melons from the Cape submitted by the Commercial

Agent in London. The subject was investigated by Mr. Massee, Principal assistant, Cryptogams, Kew, who reports:—"When first received small roundish, pale brown patches were present in scattered groups on the surface of the rind. Diseased portions were removed and placed under conditions favourable for further development; the diseased patch continued to increase in size, changed to a dark brown colour, and became slightly depressed, and within ten days were covered with a minutely velvety blackish-olive mould, which proved on examination to be *Macrosporium sarcinula*, Berk., first met with many years ago on the rind of a gourd. At the present day it frequently appears on melons imported into England, and appears to be widely distributed. The conidia or reproductive bodies of this black mould are produced in immense quantities and are scattered by wind, insects, &c; those that happen to alight on a young melon infect the fruit, and produce a new centre of disease, from which conidia are distributed in turn; hence when once introduced the disease spreads quickly unless preventive measures are promptly resorted to.

"Prevention.—Cleanliness, as in the case of every disease, is of primary importance. Decaying vegetable matter of every kind, so far as practicable, should be removed and buried. Diseased melons should not be allowed to rot and decay on the ground, otherwise a crop of spores will be produced which may result in disaster the following season. On the first indication of disease the entire crop should also be sprayed. When the disease has existed previously, spraying should be done at an early period of growth, even if no disease is present. The well-known Bordeaux mixture, half strength, might be used; or in its place a solution of sulphide of potassium would also prove effective—one ounce sulphide dissolved in three gallons of water. Fungicides act differently on foliage under different climatic conditions, and experiment alone can shew the relative strength of the mixture that may be used without scorching the foliage or fruit."

A NEW METHOD OF MAKING DRY RED WINE.

BY FREDERICK T. BIOLETTI.

*Reprinted from Bulletin No. 177 of the Agricultural Experiment
Station, of the California College of Agriculture.*

(Continued from page 634).

EXPERIMENTS: RED WINE.

1. *Over-ripe Grapes; Extraction by Heat; Use of Cooler; Pure Yeast.*—On August 21st, at 3 P. M., about twelve tons of Zinfandel grapes were passed through the crusher and stemmer and pumped by means of a must pump into a vat furnished with a strainer. The grapes were very ripe, with a large proportion of shrivelled berries, and some quite dry. There were abundant signs of Mildew (*Oidium*) and some Black Mould (*Aspergillus*). The must showed 26% Balling and .55% of acid immediately after crushing and before the sugar from the dried grapes had diffused out into the must. There was a very little second crop present.

Before placing the grapes in the vats, the latter were thoroughly washed and then swabbed with a 3% solution of sulphuric acid, which was left on the wood for several hours and then rinsed off with water. This treatment was given to all the vats used in the experiments.

As soon as the vat was full, the must was drawn off and passed through the Gomot heater, from which it passed with a temperature of 140° F. back on to the skins in the original vat. This was continued with occasional stirring of the grapes until the contents of the vat had reached a temperature of 112° F. Before passing the must through the heater, 3.75 pounds of potassium meta-bisulphite were added to it to prevent the oxidizing effect of the air on the heated grapes.

At 7 A.M. of the next day, August 22d, the must in the vat was red, but not deeply coloured. The colour was 2VR, 49.4. The must at this time showed 27% Balling, owing to the diffusion of the sugar from the dried grapes into the must. The acid was

65% and the tannin 32%. The tannin was sufficiently high, but in order to increase the colour it was decided to heat the vat again.

At 9 A.M. the must was drawn off again and passed through the heater at 150° to 158° F. and back on to the skins until the whole vat showed 133° F.

At 10 A.M. the colour had increased to 2VR, 65.6, and the tannin to 352%.

At 4 P.M. of the same day the red must was run through the cooler, reduced in temperature to 84° F., and a starter of 15 gallons of Champagne yeast added. Later, 250 gallons of water and 5 pounds of citric acid were added to the 1,700 gallons of must.

The progress of the fermentation is shewn below :

				Sugar.	Temperature.
Aug. 22,	6 P.M.	..	..	27% B.	84° F
Aug. 23,	6 A.M.	fermenting well	..	25	85
	12 M.,	water and acid added			
	1 P.M.	..	..	22	84
		Colour, 3 VR, 58; Acid, 66%; Tannin, 35%.	..		
	5 P.M.	passed through cooler	..	19	90
	7 P.M.	..	..	19	84
Aug. 24,	7 A.M.,	cooled to 84° F.	..	16	92
		Colour, 1 VR, 41.2.			
	12 A.M.	..	..	13½	87
	5 P.M.	..	..	12	89
Aug. 25,	7 P.M.,	cooled to 90°	..	7	96
		Colour, 3 VR, 27.5.			
	12 M.	..	..	5.2	90
	6 P.M.	..	..	4.5	89
Aug. 26,	6 P.M.	..	..	2.5	93
	12 M.	..	..	1.5	93
		Racked into storage vat.			
Aug. 27,		Nearly dry.			

On September 1st the wine showed 13.5% of alcohol and the colour was 4VR, 26.3. On September 7th it was nearly clear, and was racked into puncheons, and in a few days was quite dry and clear.

This experiment shows that heating the grapes to 112° F. is not sufficient to extract the maximum amount of colour of ripe Zinfandel, even though the grapes are kept hot for fifteen hours.

The fermenting wine was cooled three times. This was necessary because the regular cooling machine was not ready for use and a temporary and less efficient device had to be used. The fermenting wine was lowered 20° F. by the three coolings. This could have been done, as was proved later, by one cooling of two hours at the rate of 750 gallons per hour with the form of cooling machine finally adopted, or by two coolings of one hour at the same rate. The effect on the fermentation, however, was the same, and it continued without interruption until the wine was dry at six days, with 13.5% of alcohol. It is instructive to compare this result with Experiment III, where the cooling was intentionally

less complete. The wine of Experiment III required thirty days to become dry, though the alcohol in the wine was 1% less than in the wine of this experiment.

An examination of Fig. 6 shows that the curve representing the diminution of colour during fermentation is for the first three days very nearly parallel to that representing the diminution of the sugar-content. This probably indicates that the part of the colour insoluble in alcohol is deposited in the same ratio as the alcohol is produced by the fermentation of the sugar. This rapid fall of the colour ceases on the fourth day, the colour which remains at this time being soluble in alcohol, and the further production of alcohol has little or no effect on it. The number 27 representing the colour at the end of the fourth day probably indicates the whole amount of the original colour in the grapes which is capable of

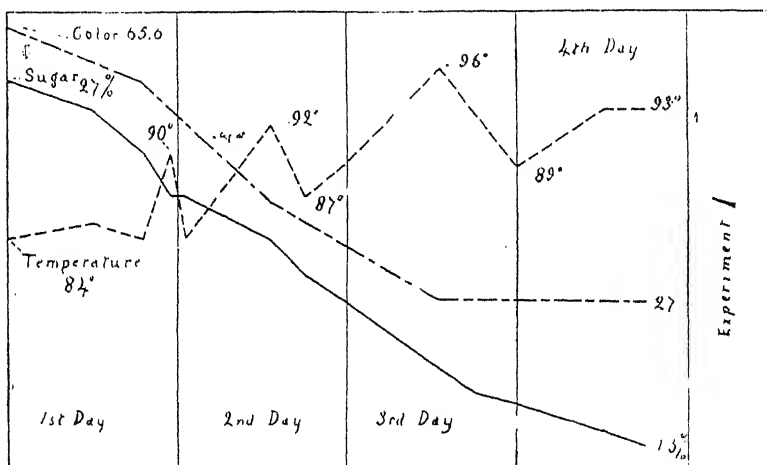


Fig. 6. Colour, Sugar, and Temperature Changes of Experiment 1.

remaining dissolved in the fermented wine. Whether all of this could have been extracted by the ordinary methods of fermentation is not shewn by the experiment, but a comparison with the results of Experiment III indicates that it could not. The wine of the latter experiment, made from grapes similar to those used in Experiment I, had only 18 of colour at the end of the fermentation. With regard to the stability of the colour the comparison is even more strikingly in favour of the new method. At the end of three months the colour of the wine of Experiment I was practically the same as when the fermentation had finished at four days, while the wine of Experiment III had lost 28% of its colour.

The broken line in Fig. 6 shews the temperature changes observed during the fermentation. A drop in temperature occurred four times. The first, a slight drop, was due to the addition of cold water used to dilute the must. The other three drops are the

effects of the coolings which were given when the fermenting wine reached 90°, 92°, and 96°, respectively. A point of interest in this curve is that the abrupt changes in temperature had practically no effect on the rapidity of fermentation, as is shown by the even curve representing the disappearance of sugar. A slight irregularity of the sugar curve may be noticed opposite each jog representing a cooling on the temperature curve, but the irregularity is so slight that it is of no practical importance. This is shown equally in Experiment IX (see Fig. 9), where coolings of 13° F. and 14° F. shew hardly any appreciable effect on the rate of fermentation. This lack of apparent influence of the cooling on the rate of fermentation is probably due to the fact that each cooling was accompanied by an aëration which invigorated the yeast and counteracted the retarding effect of the lower temperature.

II. *Under-ripe Grapes ; Use of Cooler ; Pure Yeast.*—On August 25th about twelve tons of Zinfandel grapes were crushed, stemmed, and pumped into a fermenting vat, a starter of pure Champagne yeast being added as the grapes came into the vat. The grapes were poorly coloured and not thoroughly mature. They shewed 22·7% Balling and '66% of acid. The record of the fermentation is as follows :

				Sugar.	Temperature.
Aug. 25,	10 A.M.	..	..	22·7% B.	71° F.
	7 P.M.	..	..	22·2	74
Aug. 26,	7 A.M., fermenting well	..	..	22·4	78
	12 M., fermenting well	..	..	20·4	78
	7 P.M., fermenting well	..	..	19·2	88
Aug. 27,	7 A.M., cooled to 90° F.	..	..	6·0	96
	12 A.M. ..	..	..	5·5	90
	7 P.M. ..	..	..	4·0	92
Aug. 28,	7 A.M., raked into storage vat	..	..	1·0	94
Aug. 29,	Dry.				
Sept. 7,	The wine was still cloudy, but was raked into puncheons.				

This experiment illustrates the fact that even when the grapes are gathered incompletely mature, the temperature of the fermentation must be controlled in a hot climate if we are to produce a dry wine ; and it also shews that we can not expect to produce wine of good quality from unripe grapes, as will be seen by comparing the quality of the various experiment wines as given in Table II.

The checking of the fermentation at the time of cooling is more perceptible in this fermentation than in any of the others. In this case, as in that of the last cooling in Experiment IX, the checking at cooling is probably merely a coincidence and due in reality to the large amount of alcohol present at that stage of the fermentation. The upward course of the temperature curve (Fig. 7) during the first day without any corresponding decrease of sugar is due undoubtedly simply to errors of observation. It is extremely difficult to take an average sample for either sugar or temperature determination in a vat of crushed grapes immediately after filling.

Later, after fermentation has commenced and the grapes have been well stirred, the observations are much less liable to error. The average temperature of this vat at the beginning was undoubtedly higher than 71° F. The same peculiarity is seen in the curves of Fig. 8.

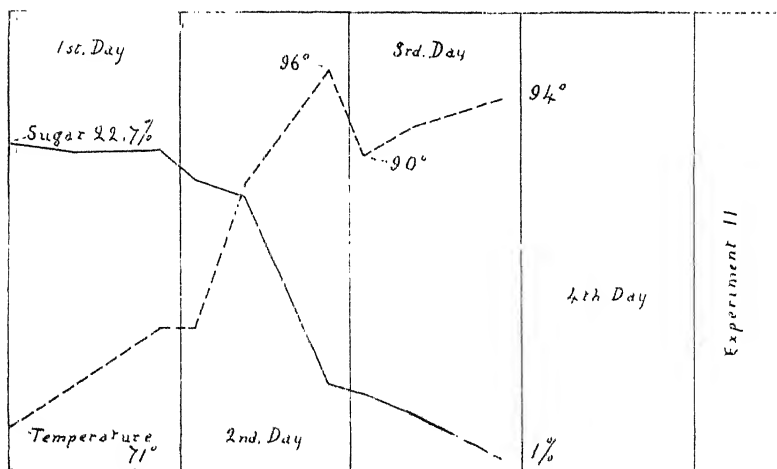


FIG. 7. Sugar and Temperature Changes of Experiment II.

III. *Ripe Grapes; Incomplete Cooling; Sulphite; Pure Yeast.*—

On August 25th about twelve tons of Zinfandel grapes in fair condition, except for a considerable amount of black mould, were crushed, stemmed, and pumped into a fermenting vat. The must shewed 23.7% Balling and .66% of acid. Pure Champagne yeast was added as the grapes came into the vat. The record of fermentation is as follows:

				Sugar.	Temperature.
Aug. 25,	6 P.M.	..	..	23.7% B.	74° F.
Aug. 26,	7 A.M.	..	..	23.2	82
	12 M.,	fermenting well	..	20.0	85
	6 P.M.	..	..	16.0	90
Aug. 27,	6 A.M.,	..	..	7.2	96
	12 M.,	cooled to 90° F. and added sulphite	..	6.0	98
	6 P.M.	..	..	6.0	90
Aug. 28,	6 P.M.,	evidently "stuck"	..	6.0	88
	12 M.	..	..	5.5	89
	6 P.M.	..	..	5.0	90
Aug. 29,	6 A.M.	..	..	5.0	92
	12 M.	..	..	5.0	92
	6 P.M.	..	..	4.5	90
Aug. 30	..	..	..	4.0	92
Aug. 31,	Racked into storage vat	..	..	3.0	90

On September 1st the colour was 5VR, 18.7, and the wine remained sweet until September 11th, when it was pumped over

for an hour. On September 22nd it was nearly dry, but still cloudy.

This experiment shews the danger of allowing the fermentation to rise as high as 98° F., but also the possibility of getting it through completely within a few weeks without any serious damage to the quality. In this case the chief loss was the extra trouble and time needed to get the wine dry. The cooling ought to have been done very early on the morning of August 27th instead of waiting until the afternoon. It was a mistake also to add the sulphite at noon on August 27th. The sulphite, if used at all, should have been added on the evening of August 26th, before the high temperature was reached.

The curves of Fig. 8 are instructive in several particulars. Compared with those of Fig. 9 they shew plainly that the hottest fermentation is not necessarily that which finishes first. In Fig. 8

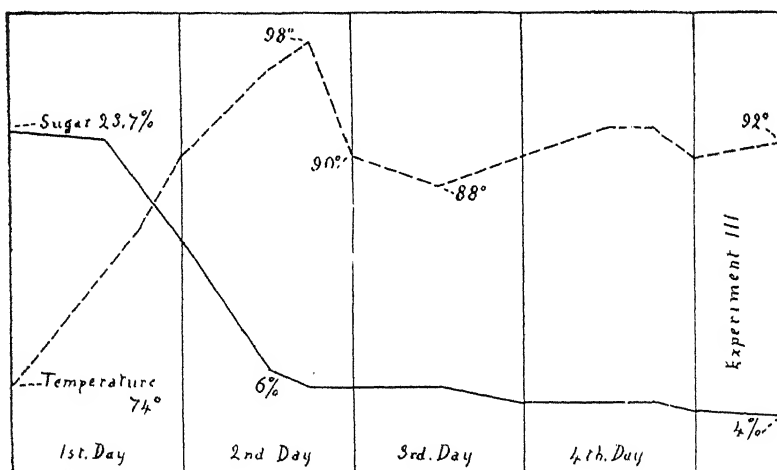


Fig. 8. Sugar and Temperature Changes of Experiment III.

the sugar curve drops very rapidly from the middle of the first day to the middle of the second, when it comes to an abrupt stop, becoming almost horizontal for twenty-four hours. The rapid loss of sugar is accompanied by a corresponding rapid rise in temperature due to the former. The temperature of 98° reached practically stops the fermentation completely for twenty-four hours. This is shewn both by the sugar remaining unchanged and by the temperature falling. The wine was cooled from 98° to 90° by the machine, and then instead of rising again, as it would have done if there had been any active fermentation going on and as it did after every cooling in Experiments I and IX (see Figs. 4, 6, and 9), it fell to 88° . This shews that there was not enough fermentation going on to counterbalance the heat lost by radiation. The vat had "stuck." The "sticking," however, was not so serious as it often is in vats which rise higher

than 98°, or stay at this temperature for some time. The cooling as soon as the temperature reached 98°, and the aëration practised afterwards, revived the fermentation, as is shewn by the gradual rise of the temperature curve and the fall of the sugar curve.

IV. *Over-ripe Grapes ; Dilution ; Addition of Acid.*—On September 1st at 11 A.M., five tons of Zinfandel grapes were crushed and stemmed into a fermenting vat. The grapes were over-ripe, some of the berries dried, and there was a large amount of black mould. The must showed 29.5% Balling and .7% acidity. It was diluted with 250 gallons of water, to which was added 6 pounds of tartaric acid.

The temperature of the grapes at the start was 73° F., and within thirty-six hours had risen to 90° F. at the bottom of the vat and 104° F. in the cap. The fermentation stuck when the sugar had fallen to 7% Balling, and could not be revived by cooling. The wine was used for port, as an attempt to make it dry would probably have resulted in spoiling it completely.

This experiment shows the futility of attempting to make a dry wine in a hot climate from over-ripe grapes, even if the acidity is increased artificially and the sugar decreased by dilution, unless we adopt some means of controlling the temperature.

V. *Over-ripe Grapes ; Dilution ; Addition of Acid ; Control of Temperature by Use of Sulphites.*—A vat of Zinfandel grapes, similar in every respect to those used in Experiment IV, was diluted and acidified in exactly the same way and an attempt made to control the temperature by the occasional addition of a calculated amount of a solution of potassium meta-bisulphite. The experiment was a failure, as the temperature ran up to a higher point than that reached in Experiment IV, and the wine stuck with 12% Balling.

This was by no means a conclusive test of the method, as the amount of sulphite used was too small. The use of sulphite was tested again in Experiment VII.

VII. *Ripe Grapes ; Pure Yeast ; Control of Temperature by Use of Sulphites ; Pomace and Must Fermented Separately.*—(Debono method, see Bulletin No 167.) The grapes used in this experiment consisted of 29% Charbono, 29% Lenoir, and 42% Burger; nine tons in all. They were ripe and in good condition, the mixture shewing 22.5% Balling. The following is the record of the fermentation :

September 2nd, 3 P. M. Crushed and added potassium meta-bisulphite solution (= .06 per mil.) and 15 gallons of Champagne yeast accustomed to sulphite.

September 3rd, 7 A. M. The fermentation had commenced, and the must was drawn off into an open vat and given another

dose of sulphite solution twice as large as the first dose (12 per mil.). The must and pomace were then allowed to ferment separately.

The further progress of the fermentation is shown by the following table:—

					Must.		Pomace.	
					Temp.	Sugar.	Temp.	Sugar.
Sept. 3,	6 P.M.	..	..	..	74° F.	22.5% B.	74° F.	22.5% B.
Sept. 4,	7 A.M.	..	..	..	86	13	94	6
	5 P.M.	..	..	..	94	10	98	2.5
Added more sulphite=12 per mil.).								
Sept. 5,	7 A.M.	..	..	..	96	4.5	100	1.5
	12 M.	..	..	..	98	2.5	100	1.0

3. P.M. The must, which had fallen to 2% Balling, was now pumped back on to the pomace and allowed to stand, after a thorough stirring, for twenty-four hours. When first mixed, the vat showed a temperature of 98° F. and 2% Balling.

Sept. 6. 7 A.M. Temperature 92° F., sugar 1.5% Balling.

12 M. Racked off pomace into open vat and aerated. The colour of the wine was 2VR, 20.3.

Sept. 7. The wine was transferred to a storage cask.

Sept. 11. The wine still tastes a little sweet and was pumped over for one hour.

Sept. 22. Still shows a slight trace of sweetness.

While this wine did not stick entirely and finally went through perfectly dry, there is no evidence in the experiment that the addition of the sulphite had the slightest effect in preventing high temperatures. The grapes had only 22.5% of sugar and were cool (74° F.) when crushed. If we reckon that each per cent of sugar in fermenting heats the must 1.17° F., the temperature of the fermenting grapes should have reached 97.5° F. when 20% of sugar had fermented out. This corresponds almost exactly to what occurred, so that there is no delay of fermentation or moderation of temperature that can be accredited to the sulphite. If sulphites are to be effective for this purpose they must evidently be used in larger doses than those adopted in this experiment.

IX. *Ripe Grapes; Pure Yeast; Extraction by Heat; Temperature Controlled by Cooling Machine.*—The grapes used in this experiment were a mixture of Grenache 45%, Zinfandel 31½%, and Lenoir 23½%. They were mature and in good condition except for a few dried and mouldy grapes and some green bunches of second crop in the Zinfandel. The must was passed through the heater and back on to the pomace until the temperature of the whole was 125° F., and the whole well stirred. This was on the afternoon of September 8th, and at 9 A. M. of September 9th the must was drawn off the pomace and cooled. The colour of the must was

1 V R, 53.4. Yeast was added, and the fermentation proceeded as follows:

				Sugar.	Temperature.
Sept. 9,	4 P.M.	..	..	23.6% B.	84° F.
	7 P.M.,	cooled to 80°	..	21.5	87
	10 P.M.	..	..	19.0	80
Sept. 10,	7 A.M.	cooled to 79°	..	12.5	92
	10 A.M.,	..	..	12.0	79
	10 P.M.	..	..	8.0	85
Sept. 11,	7 A.M.,	cooled to 78°	..	4.5	92
	12 M.	..	..	3.0	78
	6 P.M.,	..	..	2.5	78
Sept. 12,	7 A.M.,	transferred to a storage cask	..	1.0	79
Sept. 19,	Still a little sweet and still fermenting.				
Sept. 23,	Pumped over for one hour.				

This experiment exemplifies the benefit to be derived from complete control of the temperature by efficient cooling. The wine required a month to become quite dry, but at the end of that time all the sugar was eliminated, although the wine contained 15.1% of alcohol. It became dry as soon as did the wine of Experiment III.

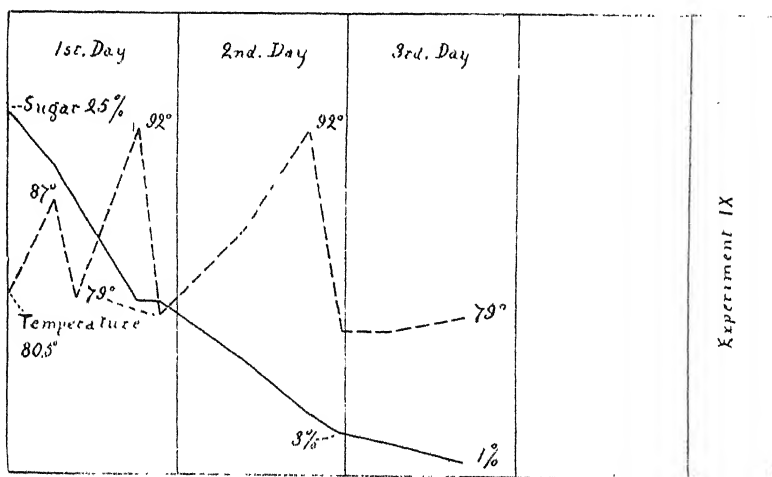


Fig. 9. Sugar and Temperature Changes of Experiment IX.

which contained only 12.5% of alcohol but was allowed to reach a temperature of 98° F. The wine was cooled three times, a total of 27° F. being taken out by the cooler. The same result could have been obtained with considerably less cooling if in order to avoid night work the first cooling had not been done sooner than was necessary. The last cooling, moreover, was much greater than was necessary and might have been dispensed with altogether.

The sugar curve in Fig. 9 is in marked contrast with that of Fig. 8. The drop in the curve is just as rapid during the first thirty-six hours, but instead of being checked there it continues for forty-eight hours until the sugar reaches 3%. Here the ferment-

ation is checked slightly but not "stuck," and the wine was practically dry in three days when Experiment III still had 5% of sugar. This difference is undoubtedly due altogether to the fact that Experiment IX was not allowed to rise above 92° F.

EXPERIMENTS: WHITE WINE.

VI. *Defecation by sulphuring; Pure Yeast; Fermentation in Puncheons.*—The grapes used in this experiment were about eight tons of Johannisberg and Franken Riesling. They were in excellent condition and were a striking example of what can be done by proper care and cultivation, even with varieties presumably so unsuited to a hot climate as the grapes of the Rhine. The grapes were thoroughly and evenly matured and shewed no sunburn, mildew, or mould.

They were crushed into an open vat, and the first 500 gallons of must which ran off were pumped into a heavily sulphured cask. After settling for twenty-four hours, the must was drawn off into three sulphured puncheons and started with pure Champagne yeast.

The following is the record of the fermentation:

Date.					Sugar.	Temperature.
August 26th	..	..	..	..	22.5% B.	78° F.
August 27th	..	..	..	..	16.7	85
August 28th	..	..	..	..	9.1	88
August 29th	..	..	..	..	4.7	88
August 30th	..	..	..	..	2.8	88
August 31st	..	..	..	..	2.0	87

The wine fermented slowly, and on September 2nd was still a little sweet. It was then pumped-over to aerate it, and on September 8th was dry and nearly clear.

Via. *Fermentation Started on Skins; Pure Yeast; Fermentation in Puncheons.*—After drawing 500 gallons of must off the crushed grapes of Experiment VI, the remainder was left on the skins for twelve hours. At the end of this time a slight fermentation was perceptible, and the must was drawn off into sulphured puncheons and started with Champagne yeast. The following is the record of the fermentation:

Date					Sugar.	Temperature.
August 26th	..	..	..	..	25.0% B.	78° F.
August 27th	..	..	..	..	8.7	92
August 28th	..	..	..	..	5.9	89
August 29th	..	..	..	..	4.4	87
August 30th	..	..	..	..	4.0	86
August 31st	..	..	..	..	4.0	84

The wine was treated in the same way as in Experiment VI, but on September 8th it was still cloudy and slightly sweet. On September 22nd it was cloudy and fermenting and had a slight brownish colour. It finally became nearly dry about October 21st

and the brownish tint had almost disappeared, though it was still cloudy.

A 50-gallon cask of each experiment wine was shipped to Berkeley and stored in the station cellar. They were tasted on November 24, 1905, with the following results:

Exp. I. Perfectly clear, full flavour, sound, fruity, and agreeable, but with a slight taste of dried grapes.

Exp. II. Cloudy, of poor colour and a little mousey.

Exp. III. Clear and a good wine, but inferior to Experiment I.

Exp. VII. Clear, odour peculiar, flavour good.

Exp. IX. Clear, a little better than Experiment VII.

Exp. VI. and VIa. Nearly clear, contain a small amount of sugar. Good, full-bodied wines of somewhat Sauterne type.

Exp. VIII. Tastes flat, but otherwise a fair wine of neutral Sauterne type.

Order of merit of the red wines: I, III, IX, VII, II; of the white: VI, VIa, VIII.

The analyses of the wine made on December 1, 1905, by Prof. George E. Colby, are given in the following table:

TABLE II.
Analyses of Experiment Wines from Fresno.

December 1, 1905.	Exp. I.	Exp. II.	Exp. III.	Exp. VI.	Exp. VIa.	Exp. VII.	Exp. IX.	Exp. VIII.
Specific gravity	.9935	.9955	.9970	.9900	.9925	.9980	.9990	.9910
Alcohol, percent. by volatile	13.80	12.30	12.50	13.25	14.50	11.70	15.10	12.60
Alcohol, grams per 100 cc ...	10.95	9.76	9.92	10.51	11.51	9.29	11.98	10.00
"Extract," grams per 100 cc	3.02	3.10	3.25	2.19	2.80	3.30	2.60	2.07
Ash, grams per 100 cc ...	.37	.38	.45	.25	.37	.57	.41	.33
Acidity, total, as tartaric; grams per 100 cc	.457	.397	.442	.390	.337	.375	.315	.375
Acidity, fixed, as tartaric; grams per 100 cc	.324	.285	.300	.300	.292	.300	.232	.315
Acidity, volatile, as acetic; grams per 100 cc ...	.108	.090	.114	.072	.036	.060	.066	.048
Sugar, total, grams per 100 cc ...	...	.200	.300	...	.300	.300	...	...
Tannin ...	.292	.160	.240	...	...	.280	.260	...

A puncheon of each of the experiment wines was kept separate and left at the cellar where they were made. They were tasted on January 1, 1906. The wines made by the new method, I and IX, were bright, dry, clean-tasting, and of good flavor. The wines made in the ordinary way III and VII, were dry and clean-tasting, clear but not bright. The main differences to be perceived in the wines were that those made by the new method were brighter and more astringent than the others.

The white wines were all in excellent condition, and, on the whole, surprisingly good wines for the district and the conditions in which they were made. The Burger was rather flat and lacking in acid.

The record of the colour-changes in the various red wines is shewn in the following table. The same record is shewn graphically in Fig. 10.

TABLE III.

Colour of Experiment Wines.

	Exp. I.	Exp. II.	Exp. III.	Exp. VII.	Exp. IX.
Before fermentation ..	2VR, 65.6	..	..	..	1VR, 53.4
After fermentation ..	3VR, 27.5	R, 13.1	5VR, 18.7	2VR, 20.3	22.4
3 months' fermentation ..	..	3R + Y, 7.5	5VR, 13.4	2R, 13.0	4VR, 19.6
4½ months' fermentation ..	3VR, 16.2	3R + Y, 5.3	R, 10.2	1R, 9.7	4VR, 17.0
Loss of colour in 3 months	..	43%	28%	36%	12%
Loss of colour in 4½ months	41%	60%	45%	52%	24%

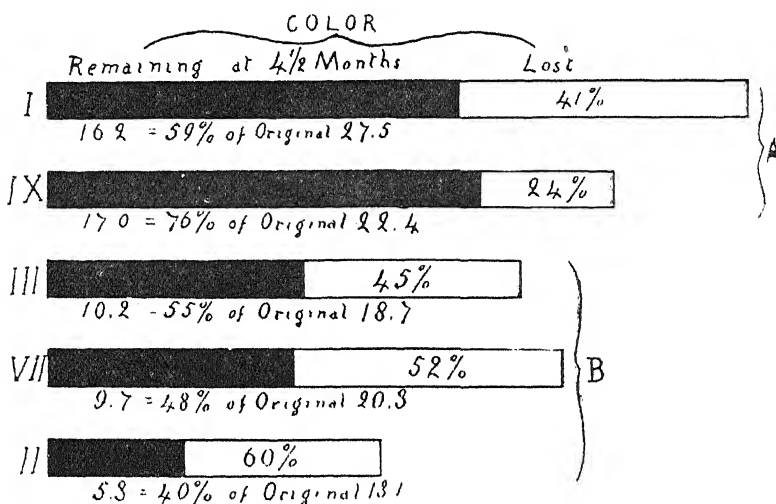


FIG. 10. COLOUR OF THE RED EXPERIMENT WINES.

A. Colour extracted by heating before fermentation.

B. Colour extracted in the ordinary way by fermentation.

Shaded Portion = Colour remaining January 15, 1906.

Clear Portion = The amount of the original colour lost.

The sum of the above is the amount of colour in the wine when it was taken from the fermenting vats to the storage casks.

Figure 10 shows graphically two very important points in favour of the new method: First, the colour extracted by heating before fermentation is as high or higher than that obtained by the usual method; and second, that it is more stable. Leaving out the wine of Experiment II, which was made from unripe grapes and was therefore abnormal, we find that the average loss of colour of

the heated wines in $4\frac{1}{2}$ months was 32.5%, while that of the ordinary wines in the same period was 48.5%. Experiment II was cloudy and of poor quality.

CONCLUSIONS.

The most important conclusion to be drawn from these experiments is that sound dry wine of fair quality can be produced in the upper San Joaquin Valley and similar regions from the varieties of grapes growing there, simply by ordinary attention to cleanliness, the sterilization of cooperage, and more than ordinary attention to the control of temperature.

For white wines a thorough preliminary defecation of the must by means of sulphur fumes and the use of pure yeast starters is advisable.

For red wines some form of cooling machine is essential, and the temperature of the fermenting wine should never exceed 95° F., and if possible should be kept below 92° F. This can be easily and perfectly done by means of the cooling machine.

The grapes both for white and red wines should be thoroughly ripe. Ripeness must be determined by the flavour and appearance of the grapes more than by the amount of sugar they contain. We can not hope to get the best results from imperfectly ripe grapes even if they contain 22% of sugar. Some varieties in the climate of the San Joaquin Valley are not perfectly mature for wine-making purposes until they contain 25% of sugar or more. Better results are to be obtained by diluting and, if necessary, adding tartaric or citric acid to over-ripe grapes in this region than by attempting to make wine from under-ripe grapes which have not developed the colour, body, and flavour necessary for the production of good wine.

Finally, the claims made in Bulletin No. 167 for the new method of wine-making have been abundantly verified by these experiments. The preliminary extraction of colour, tannin, and body by means of heating before fermentation has utilized more perfectly than any other method tested, all the good qualities of the grapes and remedied more completely the bad qualities. The wines made by this method have shewn better colour and flavour, have developed and kept better, and have in every way shewn themselves superior to the others. The only thing remaining to be tested regarding it is the cost when carried out on a large scale. For this purpose a plan of a cellar suitable for the use of this method, and the mode of operation with this plan, are given. While the method could be adapted to any cellar without changing the vats or casks at present in use, it would be much simpler and more easily managed in a cellar specially constructed for the purpose.

The plan as given provides only for the manufacture of dry red wine. The addition of some defecating vats would make it equally adapted to the making of dry white wine. The manufacture of sweet wines would be better done in a separate crushing and fermenting room adjoining, though it could be done with the same machinery. It is at present doubtful if the heating method could be adapted to the manufacture of port wine. The experiments at present indicate that too much tannin would be extracted for the best port. It might be possible to modify the method so as to make it applicable to this purpose, but at present this seems hardly necessary, and the improvements in the manufacture of port will probably lie in the direction of cool fermentations and long maceration of the pomace.

PLAN OF FERMENTING ROOM TO WORK 50 TONS OF RED GRAPES
PER DAY.

EXPLANATION OF FIGURES 11 AND 12.

Fifty tons per day=11,000 gallons of crushed and stemmed grapes.

Fifty tons per day=8,300 gallons of wine=250,000 gallons per season of thirty days.

(By working installation continuously 400,000 gallons per season could be handled with the same installation.)

- H. Four extracting vats, 12 feet by 12 feet by 12 feet ; capacity, 13,000 gallons. (11,000 gallons will fill them to within 19 inches of the top.)
- D. Two drainage vats, 12 feet by 12 feet by 6 feet ; capacity, 6,500 gallons.
- F. Six fermenting vats, 20 feet by 10 feet by 6 feet 6 inches ; capacity, 9,000 gallons. (8,500 gallons will fill them to within 10 inches of the top.)
- W. Two pump wells to hold 250 gallons.
- E. Gomot heater to heat 1,000 gallons of must from 70° to 150° F. in one hour.
- C. Cooler consisting of 240 feet of 1½-inch copper pipe and 3-inch No. 10 canvas hose. (Will cool 1,000 gallons of must from 125° to 80° F. in one hour with 1,000 gallons of water at 70° F.)
- P. Two pumps to handle 1,500 gallons per hour each.
- K. Two cooling coils consisting of 80 feet of 1-inch copper tubing (Maximum cooling effect needed, allowing 50% for cooling by radiation requires 125 gallons of water at 70° F. per hour for 72 hours for each vat. This equals 9,000 gallons for each vat or each day. This will keep the wine below 92° F.)
- T. Carrier for crushed grapes.
- S. Carrier and strainer for crushed grapes.
- L. Strainer at bottom of heating vat.
- R. Crushing platform.

- M. Must sump to receive must from strainer S.
- Y. Carrier for extracted pomace.
- b. Pipe leading from heater to heating vats.
- a. Pipe leading from well of strainer to drainage vats.

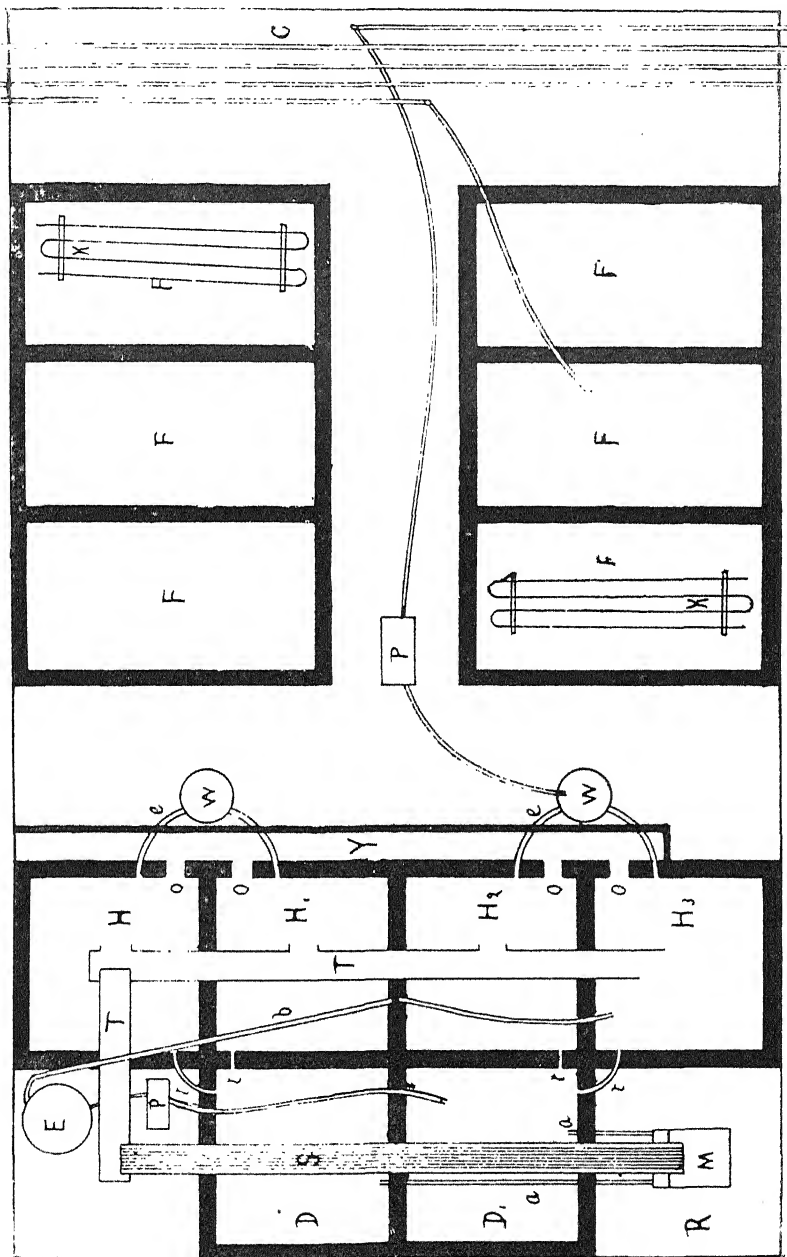


FIG. 11. GROUND PLAN OF CRUSHING, EXTRACTION, AND FERMENTING ROOM.

- o. Manholes for removal of extracted pomace.
- e. Pipe for conducting heated must to pump well.
- r. Pipe for conducting cold must into drainage vats.

Method of Operation.—1. The grapes are crushed and stemmed in the ordinary manner on the crushing platform (R). A solution of potassium meta-bisulphite is gradually added to the crushed grapes as they pass from the crusher. The solution is made by dissolving 80 pounds of the salt in 100 gallons of water, and is used at the rate of one gallon to every ton of crushed grapes. This is equivalent to .2 per mil. of SO_2 , and is sufficient to prevent fermentation until the extraction can be accomplished, and helps to dissolve the colour of the skins, and to prevent the must from becoming oxidized.

2. The crushed grapes are carried by an ordinary drag-carrier up the strainer (S) and along the flume (T) to the extraction vat which is being used. The strainer (S) is similar to the usual box flume used in wineries, except that it is provided with a false bottom consisting of longitudinal slats, which permit a large portion of the must to run back into the must sump (M).

3. The must is then allowed to run from M and from the extraction vat into one of the drainage vats (D).

4. As soon as the drainage vat is nearly full, or any time within twelve hours, the must is passed through the Gomot heater (E) and pumped back on to the top of the grape skins in the extraction vat. The opening (r) at the bottom of the extraction vat is meanwhile left open so that the hot must entering at the top will drive out the cold must at the bottom into the drainage vat.

5. As soon as the must, flowing from the extraction vat into the drainage vat, shews a rise in temperature the heater is connected with the opening (r) at the bottom of the extraction vat. The stream of hot must now enters the extraction vat from the bottom below the strainer (L), and being hotter and therefore lighter than the rest of the must in the vat will tend to rise and thus to equalize the temperature in all parts of the vat of crushed grapes. In this way the skins will all be thoroughly heated, and the extraction completed without stirring or using the heater on half-heated must, which would result in a loss of efficiency.

The temperature to which it will be necessary to raise the must as it passes through the heater will depend on the initial temperature of the grapes and on the amount of must which it is possible to separate. By proceeding in the way described, it would undoubtedly be possible to separate an amount of must equal to two-thirds the volume of the grapes, or about 145 gallons per ton. If the temperature of the grapes therefore was 70°F. , and the must was passed through the heater at a temperature of 153°F. , the whole contents of the extracting vat would be raised to 125°F. , which is the temperature required.

the fermenting vat should be allowed to fall through the air in order to aërate it thoroughly. This is essential for a quick and thorough fermentation.

9. As the fermenting vat is being filled, about 75 gallons of yeast should be added. This yeast may be prepared as described, or it may be simply some fermenting wine taken from one of the other vats that is in full fermentation. The use of pure yeast as described is preferable, as the actual amount of yeast added is more easily controlled. If we use 75 gallons of fermenting wine from another vat the amount of yeast in it, and still more the character of it, will vary very much according to the stage of fermentation at which the wine has arrived. Yeast prepared by the method indicated will always be in full vigour and the number of active cells present will be fairly constant. This will cause the fermentations to be more regular and simplify the control of temperature.

10. As soon as the must ceases to run from the extraction vat the gate (O) is opened and the pomace shoveled out to the carrier (Y), which takes it to a continuous press. The must from the press is mixed with that already in the vat. It will probably be unnecessary to cool the press must.

11. Fermentation will start immediately, and as soon as the temperature rises to 90° F. one of the cooling coils (K) should be lowered into the must a couple of inches below the surface and water run through it. No stirring of the fermenting liquid will be necessary, as the heating must rises to the surface, is cooled on contact with the copper coil, and sinks again. This keeps up a constant circulation. A moderate aëration should be given once a day, either by pumping-over or by means of an air compressor. Unless this is done the fermentation will be inconveniently slow. If too much aëration is given the quality and colour of the wine will be injured.

12. At the end of three days the wine should not contain more than 1% or 2% of sugar and should mark 0 on the saccharometer. It should then be transferred to the storage cellar, being given a thorough aëration in the transfer.

Figure 13 shews the sequence in which the various vats shewn in Figs. 11 and 12 would have to be used. Each circle represents a vat.

Each column represents a day, and shews the condition of all the vats on the day indicated at the head of the column.

Each horizontal file shews the condition of a vat on the various days indicated.

Each heavy line represents the course of the must handled on a single day. For example, on the first day the must from the crusher falls into extraction vat H and runs into drainage vat D. On the second day it is taken from D, passed through the heater and back into H. On the third day the must, now containing

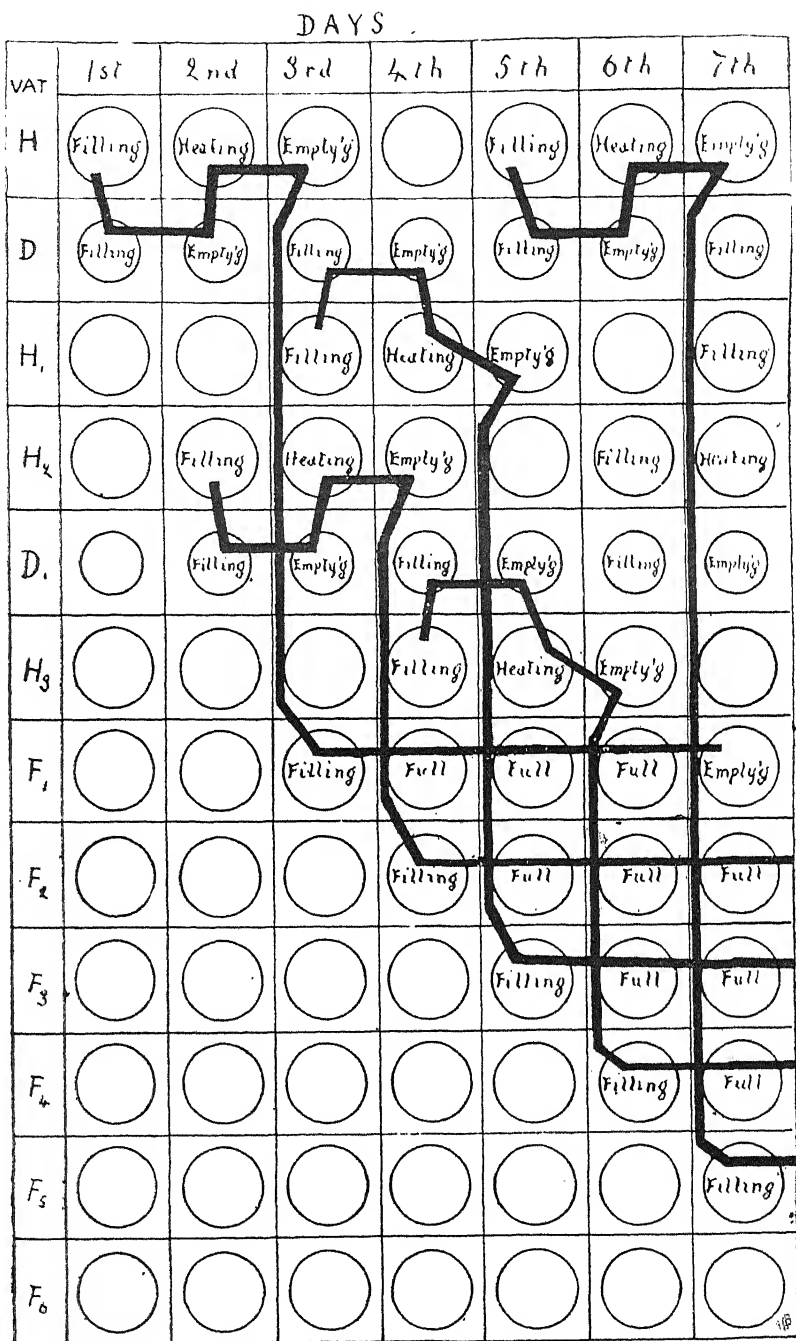


FIG. 13. Diagram showing order in which vats must be used.

colour and tannin, is taken from H and passed through the cooler into fermenting vat F. It stays in F during the fourth, fifth, and sixth days, and is transferred to a storage cask on the seventh. When everything is in full running, as on the seventh day, and as indicated in the figure, one of the extraction vats (H_1) is being filled from the crusher. The cold must from H_1 is draining into one of the drainage vats (D). Another extraction vat (H_2) is being heated by the must from the other drainage vat (D). Another extraction vat (H) is being drawn off and the hot red must passed through the cooler into one of the fermenting vats (F_5). The fourth extraction vat (H_3) is empty and being prepared for filling on the following day. Three of the fermenting vats (F_2 , F_3 and F_4) are full of fermenting wine, and one (F_1) is being emptied of fermented wine. The sixth fermenting vat (F_6) is empty and ready for filling the following day.

The whole process could be very much shortened if needed. The extraction, instead of taking seventy-two hours as indicated, could be better done in thirty-six hours, and the must need not stay in the fermenting vats, from the commencement of filling to the end of emptying, more than four days. In this way the output could be increased from 8,300 gallons per day of twenty-four hours to over 13,000 gallons; and with the addition of another fermenting vat and a corresponding increase of the cooling apparatus to 15,000 gallons per day.

ACKNOWLEDGMENTS.

The successful carrying out of the foregoing experiments was rendered possible by the co-operation of members and employés of the California Wine Association, who provided all the necessary grapes and cellar facilities and assisted materially by their interest and co-operation.

Our thanks are also especially due to Messrs. T. R. Meakin and Son, whose advice and skill in constructing the needful apparatus very much facilitated every stage of the work; and to Mr. B. J. Wingfield, who carefully and skillfully attended to all the details of the experiments.

WHEAT BREEDING AND RUST RESISTANCE.

BY W. T. SAXTON, B.A.

The question whether or not South Africa is a country adapted to the raising of large wheat crops is one which is constantly recurring, and which is of vital importance to the agriculture of the country.

There are some who answer it in the negative. They point out that the wheat production of this country has been decreasing for many years, as far as statistics are available,* and also that no wheat has yet been grown in South Africa which can resist the ravages of rust.

Those, on the other hand, who have followed the course of wheat-raising carefully in other countries, especially of late years, are inclined to foresee a great future here, given *two* conditions, hitherto lacking:—Firstly, *Irrigation* on a large scale; and, secondly, the breeding *in South Africa itself* of a wheat, which, besides fulfilling the requirements of the miller, is sufficiently resistant to rust.

With the first condition this paper is not concerned.

The chief interest centreing at the present time round the question of breeding rust resistant wheats is this: that during the last five years enormous strides have been made in the knowledge of the laws of inheritance. These enable the breeder, instead of groping in the dark with a mass of apparently meaningless facts, to predict almost with certainty the results of cross-breeding two varieties of a wheat or other plant.

To make the matter clear, it is proposed to give a short account of these laws, and of the experiments on which they are based.

Shortly after the middle of the last century there lived in an Austrian monastery a priest, named Gregor Mendel. He carried out some exceedingly interesting experiments in cross-breeding the sweet peas in his garden, and the results of his experiments were published in 1865 in an out-of-the way Austrian journal, and lost sight of by the scientific world for thirty-five years.

* See Agricultural Census, 1891 and 1904. Wallace's Farming Industries of Cape Colony, etc.

In the year 1900 three well-known botanists, Correns, De Vries, and Tschermak, independently came across this publication of Mendel's and republished his work, which they felt was of very considerable importance, and, in the last five years, "Mendel's laws," as they are called, have revolutionized the ideas of all but the most conservative biologists, about inheritance.

Instead of describing the actual experiments carried out by Mendel with sweet peas, it will be more to the purpose of this paper to describe precisely similar experiments carried out with wheats.

If the two varieties of wheat known as "Bearded White" and "Stand-up-White" (Carter's) are compared, it will be found that they differ in respect of only one pair of characters, namely, that the former is bearded and the latter beardless.

Now, if "Bearded White" is pollinated with pollen from "Stand-up-White," or, *vice versa*, "Stand-up-White" is pollinated with pollen from "Bearded White," and the seeds produced by both varieties sown, the resulting plants will all be exactly alike.

Another curious point is that these hybrids do not, as we should expect, show an intermediate appearance between those of the two parents, but they are all entirely beardless, the only difference between them and the "Stand-up-White" parent being the greater luxuriance of the hybrid.

The character which predominates in this way in the hybrid is called by Mendel the *Dominant* character, and that which is apparently lost the *Recessive*.

Thus, in the case we are considering *Beardless* is the Dominant character, *Bearded* the Recessive.

Next the hybrid generation is allowed to set seed normally, *i.e.*, by self-pollination, and the seed thus obtained is sown.

On raising the next (second) generation of plants a very remarkable result is obtained, known amongst breeders as the "Breaking of the Type." The Bearded character (Recessive) re-appears in the proportion of one bearded plant to three beardless (or approximately in the ratio 1 : 3).

Continuing to "in-breed" with the plants thus obtained, it is found that all the Bearded plants (which agree in every respect with the "Bearded White" parent) breed true. This is not the case with the Beardless forms, but it is found that one out of every three plants will breed true, the other two breaking up again exactly as the first-cross generation broke up, *i.e.*, of every four plants one will shew the Bearded (Recessive) character and three the Beardless (Dominant) character.

Further breeding only gives a repetition of the previous results.

Mendel only formulated his "law" after carrying out more elaborate experiments, but these will be easier to understand if we at once state the hypothesis known as "Mendel's law."

It is a well-known fact that fertilization in plants is brought about by the union of two very minute portions of protoplasm, that derived from the pollen grain being the male (δ) and that from the ovule the female (♀). We may call these minute portions of protoplasm "Gametes" whether they are δ or ♀ , as, according to Mendel, they are of exactly equal value as far as his law is concerned.

With this preface we are in a position to formulate the law, which is that "Gametes are pure in respect of one of any pair of differentiated characters." Taking the case we have just been considering, this means that the "Gametes" (as defined above) of the plants bore either the Dominant character, Beardless, or the Recessive character, Bearded, and could never transmit any trace of the other character.

Mendel very naturally assumed that every Gamete from the original Beardless parent would be pure in respect of the character Beardless, and (in the first cross) would fuse with a Gamete from the Bearded parent, equally pure in respect of the character "Bearded." Then the offspring must each contain, so to speak, the "germs" of the two characters "Beardless" and "Bearded."

Now to explain the fact that the offspring *show* only the one character "Beardless," Mendel supposes that whenever the characters "Beardless" and "Bearded" are both present in a plant, the character "Bearded" is masked by the other, which he therefore appropriately terms Dominant. The same is assumed to be the case when one of any pair of characters shows this phenomenon of Dominance.

[To save useless repetition the symbol D, will in future be used for "Dominant" and R for "Recessive."]

Now if each of these "first-cross" plants contains both the D and R characters, and if the Gametes produced are to be pure in respect of either the D or R character, we may suppose that each will produce D and R Gametes in equal numbers. These plants being then self-pollinated, it is clear that, if the laws of chance hold good, the combinations $D \times D$, $D \times R$, $R \times D$, and $R \times R$ will be produced in equal numbers. Clearly also the first three will all *appear* alike (the R character being always masked when the D character is also present), but only one will breed true, whereas the plants produced by the fourth combination ($R \times R$) *all* breed true, as well as having a similar appearance.

As a check to the results, let us cross-breed one pure parent (say R) with the first cross from both pure parents (*i.e.*, D R). Then, according to the theory, we should obtain equal numbers of pure Recessives (*all* of which breed true) and cross-bred Dominants (*none* of which breed true), and this is found to be the case. If the same experiment is carried out, substituting the pure D parent for R, *all* the offspring *appear* Dominant and half breed true, as the theory demands.

Mendel's next important series of experiments were carried out with plants differing in respect of *two* pairs of characters (*e.g.*, Bearded and Beardless, Seed smooth and Seed wrinkled).

In this case it may happen that the first cross completely resembles one parent, or it may resemble one parent in respect of one pair of characters and the other in respect of the other pair. This simply depends upon which characters are dominant.

Let us apply Mendel's law to this case. In order to make the matter clear it will be easiest to take a concrete instance, and, as before, instead of taking Mendel's own experiments with sweet peas, precisely similar experiments with wheats will be used.

For instance, take the two varieties of wheat known as "Rough Chaff" and "Golden Drop." The former has a white, rough chaff, and the latter a red, smooth one.

The characters of the hybrid are a rough and red chaff, indicating that "roughness" and "redness" are Dominant. For the sake of convenience call the D characters "Roughness" and "Redness" A and B respectively, and the R characters "Smoothness" and "Whiteness" *a* and *b*. Since the gametes are, by the theory, pure in respect of one of each pair of characters, they must have a constitution represented by one of the four combinations AB, Ab, aB, ab. On now combining these four kinds of gametes in every possible way we obtain the following:—AB × AB, AB × Ab, AB × aB, AB × ab, Ab × AB, Ab × Ab, Ab × aB, Ab × ab, aB × AB, aB × Ab, aB × aB, aB × ab, ab × AB, ab × Ab, ab × aB, ab × ab.

Now a female gamete carrying the characters AB being fertilized by a male gamete carrying the same characters, the hybrid will necessarily have these characters also (*viz.*, "roughness" and "redness"), so we can write AB × AB simply as AB.

When such a ♀ gamete (AB) is fertilized by a ♂ gamete bearing the characters Ab the resulting hybrid has the *three* characters A (roughness), B (redness) and b (whiteness), so we can write AB × Ab simply as ABb. The same result is obtained by the union of a ♀ gamete Ab with a ♂ gamete AB.

Applying this throughout we find that all the possible resulting hybrids are denoted by the following symbols:—

AB, ABb, AaB, AaBb, ABb, Ab, AaBb, Aab, AaB, AaBb, aB, aBb, AaBb, Aab, aBb, ab,

or, on adding up, AB, Ab, aB ab, 2 AaB, 2 ABb, 2 Aab, 2 aBb, 4 AaBb.

Of these AB, 2 AaB, 2 ABb and 4 AaBb contain the "germs" of *both* the dominant characters A (roughness) and B (redness) and will therefore all alike appear rough and red to the eye, irrespective of whether or not they also contain the "germs" of the recessive characters. As we see, however, from the constitution, only one of the nine forms will breed true.

Similarly Ab and $2 Aab$ appear rough and white, but only one of the three breeds true; also aB and $2 aBb$ appear smooth and red, and one of the three breeds true.

Again, only the one plant ab out of the whole possible sixteen will appear smooth and white, but *all* such plants will breed true.

To recapitulate briefly, on crossing two plants with the characters Ab and aB respectively the hybrid has the constitution represented by $AaBb$, but *appears* as AB , because A and B are the "dominant" characters. Therefore, at the "breaking of the type" the actual constitution of the second generation is as shewn above, but they *appear* in the proportion $9 AB : 3 Ab : 3 aB : 1 ab$. This proportion $9 : 3 : 3 : 1$ is constant for any two pairs of characters shewing the phenomenon of "dominance."*

With *three* pairs of such characters the case becomes more complicated. It will suffice to say that eight different combinations are possible which breed true, and numerous others which do not, but each of which conforms in appearance to one of the pure-bred plants.

Enough has now been said of the purely scientific aspect of Mendelism.

Its economic value can be readily seen. In wheats, susceptibility and immunity to Rust, strength and weakness (from the miller's point of view) and many other characters, such as those we have taken as examples, are pairs of "Mendelian" characters.

To illustrate the principle, suppose we have two wheats, one practically immune to Rust but not a "strong" wheat, and the other "strong" but susceptible to Rust.

Cross-breed them. The first cross will indicate which of the pairs of characters are dominant and we then know exactly what to expect in the second generation.

As a matter of fact immunity to Rust is a recessive character† and it is supposed that "strength" is a dominant character.‡ Thus about $\frac{3}{16}$ of the second generation will shew the required characters and $\frac{1}{16}$ will breed true.

If 100 plants are raised in the second generation about 15-20 would shew the required characters, and a seed sample *from each plant* must be sown separately. In the following season the plots from the *pure* parents will shew plants all alike and the plots from the other parents will shew two kinds of plants, so that there is no difficulty in separating them. The number of pure plots should be about five or six in this case.

*There are certain pairs of characters which apparently do not shew this phenomenon of "dominance." Such pairs of characters, as we have considered, which *do* shew it are termed "Mendelian" characters.

†See Biffen, "Mendel's Laws of Inheritance and Wheat-breeding," *Journal of Agricultural Science*, Jan., 1905.

‡So far as I know no published results are available on this point, but I understand from Mr. Biffen that the above is probably correct.

This process of cross-breeding should be undertaken in every district where wheat is grown. Wheats which are rust-proof in Canada or England may be anything but rust-proof in South Africa, and the same is true to a less extent for less widely separated areas.

Improvement, even in the rare cases where a satisfactory wheat has already been found, is always possible.

The principle is simple. Find a wheat which is rust-proof in the district, irrespective of whether it is satisfactory from any other point of view.* Cross it with another wheat which fulfils other requirements. Then in the second generation pick out *all* the plants shewing the required combination of characters and sow separately a seed sample from each such plant, which will shew which are pure-bred as soon as the third generation is harvested.

In practice, two wheats which agree in respect of as many characters as possible should be chosen, as the number of possible combinations increases rapidly with the number of characters in respect of which the parents differ, and hence the difficulty of obtaining a form to breed true.

With respect to the Rusts in South Africa, it is stated in Wallaces "Farming Industries in Cape Colony" (1896) that "Rust of wheat is caused by the fungus *Puccinia graminis*." Now *Puccinia graminis* is not the only species of *Puccinia* causing Wheat-rust, though it is the most virulent in this country. In England, for instance, *Puccinia glumarum* does a great deal more damage than *P. graminis*. It should be borne in mind in connection with the problems of Rust resistance that a wheat immune to *P. graminis* may not be so with respect to *P. glumarum* and *vice-versa*.

Anyone interested in the subjects discussed in this paper will find Mr. Biffen's experiments in wheat-breeding most interesting. A full account of these is published in the *Journal of Agricultural Science*, January, 1905 (Cambridge University Press).

* Hitherto the attempt has been made to find a wheat which combined immunity to Rust with other good characters.

EXPERIMENTAL CROPS IN CAPE COLONY.

SALT BUSHES.

BY DR. ERIC A. NOBBS, Agricultural Assistant.

To many the salt-bush is no longer an experimental plant, but an assured success, and a valuable addition to their veld. To others, however, it is not yet known, and it is with a view to spreading the knowledge of its uses, of trying it in districts where it has not yet obtained a footing, and of testing the qualities of the several isolated species, that the Department has distributed quantities of the seed to applicants all over the Colony, the reports of some of whom are now published.

In the *Agricultural Journal* for March, 1905, a full account of the salt-bushes will be found, but for those who do not have access thereto, it may be briefly stated that while we have several salt bushes of our own, that introduced and distributed in 1889 by Professor MacOwan and Mr. Alston, of Van Wyk's Vlei, possesses a more vigorous growth and a greater reproductive power in addition to its nutritious and tasty herbage, and the power of growing on soil too brack (alkaline) for other things. While particularly a food for drought, the salt-bush supplies a desirable change at all times, its saline properties making it serve in place of a lick, while it is claimed to be a cure and preventive of fluke. Every form of stock devours it, in spite of the statement to the contrary in some of the reports, where, probably, the quantities grown were insufficient to enable the animals to acquire the taste, which, as is well known, they must generally do for all new forms of fodder.

The fact often seems to be overlooked, that as their very name implies, the salt-bushes are specially adapted for growing on brackish and alkaline soils, and while doing better than anything else in such situations, are not to be recommended for sowing on fallow land or in gardens where other and better things can be grown.

ATRIPLEX NUMMULARIA, LIND.

Fewest reports have been received regarding this, the common or Alston's salt-bush since but little has been distributed, it being

regarded, more or less. as one of our established fodder plants, and the seed being readily procurable to purchase in the Colony. The imported seed has seemingly proved inferior to our own, which, as a rule, germinates readily in congenial locations, especially if sown about now, and favoured with a good shower shortly after.

Reports.

1. Messrs. Battenhausen Bros., Britstown. Sown October 1, 1905. Result, good. Remarks: Good for all stock; will pay to sow all over veld. Stands very driest of weathers.

2. Mr. M. G. Godlonton, Kroomie Siding. Sown October, 1905. Result, good. Remarks: This is a better bush than *Holocarpa*; grows bigger and with more foliage, but seeds much less profusely. Seed came up badly. It is not affected by frost.

3. Mr. P. J. Mostert, Cape Town. Different times. Result, negative. Remarks: Seed has failed to germinate, so far. Started sowing it with first rains, 11th July, 1906.

4. Mr. A. S. Evens, Cathcart. Sown 19th September, 1905. Result, negative. Remarks: Failed to germinate. Not having any brack ground to sow seed on, and being very cold, failure may be due to this.

ATRIPLEX SEMIBACCATA, R.BR.

This is the variety which has given the best results in California, to which country it was introduced several years ago, and seems, on the whole, to be giving a good account of itself here too, and to be worth further trial. The following are the reports received so far:—

1. Mr. C. E. de Wet, Robertson. Sown September and October, 1905. Result, good. Remarks: This does better than either *A. holocarpa* or *A. angulata*, as it grows stronger and flatter on the ground, and is not destroyed so much by wind.

2. Mr. J. P. Kennedy, Robertson. Sown early in May, 1905. Result, good. Remarks: Very good; bears and spreads out better than any other variety of saltbush.

3. Mr. R. C. Holmes, Pearston. Sown, not stated. Result, good. Remarks: Best of the three varieties sent. Does not seed so early or freely as *Holocarpa*. Should be good feed for ostriches.

4. Mr. G. E. C. Christian, Cradock. Sown 21st July, 1905. Result, fair. Remarks: Fed off by stock, followed by good rain; did not grow again, so I don't think it will do on the veld during any ordinary season.

5. Messrs. Battenhausen Bros., Britstown. Sown 1st October, 1905. Result, good. Remarks: Eaten greedily by all stock. Should be sown all over veld.

6. Mr. C. H. Verity, Middelburg. Sown 18th August, 1905. Result, negative. Remarks: Failed to germinate.

7. Mr. J. J. Hooker, Knysna. Sown spring, summer, autumn. Result, good. Remarks: Grows well on damp, brack soil, but not very well on sandy soil.

ATRIPLEX HOLOCARPA, F.V.M.

This has also proved a success, as may be seen from the accompanying nineteen reports, although there seems to be difficulty in some cases to get it to germinate. It is a low creeping form, and is recommended in Australia for land that is liable to occasional flooding. Sometimes it behaves as an annual, sometimes it is perennial:—

1. Mr. J. B. Leach, Queenstown. Sown September, 1905. Result, good. Remarks: Will prove a most valuable fodder plant grown on brack soil. Stock very fond of it, self sows. From my small patch reaped 10 mud bags of seed. I intend sowing all this on my farm.

2. Mr. A. S. Evens, Cathcart. Sown September and April, 1905. Result, negative. Remarks: Seed failed to germinate. Will try it in January and February of this year.

3. Mr. G. E. Matthews, Victoria East. Sown, not stated. Result, good. Remarks: Sown in brack valley. Did splendidly. All stock eat it readily, even poultry.

4. Mr. M. G. Godlonton, Kroomie Siding. Sown, different dates, August, 1905, to January, 1906. Result, negative. Remarks: Germinates badly. Thrives best on brack land.

5. Mr. R. C. Holmes, Pearson. Sown, not stated. Result, good. Remarks: Appears to be drought resistant. Came up well, seeds early and very freely. Germinates at any time of the year when rain falls. Should be good feed for ostriches.

6. Mr. J. Meintjes, Graaff-Reinet. Sown August, 1905. Result, negative. Remarks: Seed failed to germinate.

7. Mr. M. J. Hall, Middelburg. Sown March. Result, good. Remarks: Greedily eaten by all stock. If allowed to seed, this variety dies. Should be sown February or March. Will grow on any veld without irrigation.

8. Mr. G. H. Verity, Middelburg. Sown August. Result, good. Remarks: Has stood drought well. Suitable for sheep and ostrich chicks after running on lucerne, and will pay. Plants have more seed than leaves.

9. Mr. G. E. C. Christian, Cradock. Sown 31st July, 1905. Result, bad. Remarks: Had to water seed, which germinated badly. Grew, seeded, and then died off, and has never grown again, and therefore will not do on the veld.

10. Mr. H. Baldie, Uniondale. Sown 4th April, 1905. Result, fair. Remarks: Seed failed to germinate on ordinary soil, but grew all right on a bit of brack ground.

11. Mr. G. C. de Wet, Robertson. Sown September and October, 1905. Result, good. Remarks: Only about 12 bushes grew; better than *angulata*. Cattle don't care for Saltbush.

12. Mr. J. P. Kennedy, Robertson. Sown May, 1905. Result, good. Remarks: Bears and grows well in very dry weather on brack soil. Excellent for stock, especially goats and ostriches.

13. Mr. J. J. Hooker, Knysna. Sown spring, autumn, and winter, 1905. Result, good. Remarks: Grows well on damp, brack soil, but not very well on sandy soil.

14. Mr. L. Knoblauch, Caledon. Sown April, germinated August. Result, good. Remarks: Grows luxuriantly. Cattle don't care for it, but sheep eat it readily.

15. Mr. C. G. B. van Blerck, Malmesbury. Sown August, September, and October. Result, good. Remarks: Think it will pay, especially if it will spread naturally.

16. Messrs. Battenhausen Bros., Britstown. Sown October and late in summer. Result, good. Remarks: Eaten by all stock greedily. An excellent bush to grow all over the Karoo.

17. Mr. J. G. Wilkinson, Herbert. Sown December. Result, negative. Remarks: Failed to germinate owing to drought I think.

18. Mr. J. T. Monham, East Griqualand. Sown October. Result, fair. Remarks: Came up all right, but when seeding heavy rains buried it. Not suitable.

19. Mr. J. G. Campbell, East Griqualand. Sown January, 1905. Result, negative. Remarks: Seeds failed to germinate.

ATRIPLEX ANGULATA. BENTH.

This species, while occasionally successful, does not seem to have given such good results as the others, and hence may well be discarded in favour of the better ones.

Reports.

1. Mr. G. C. de Wet, Robertson. Sown October, 1905. Result, good. Remarks: Grows well and bears abundantly. Seed germinates badly; only six bushes came up.

2. Mr. J. Kennedy, Robertson. Sown May, 1905. Result, good. Remarks: Bears and grows well in driest weather on brack soil. Very good for stock, especially goats and ostriches.

3. Mr. J. G. Wilkinson, Herbert. Sown December, 1905. Result, negative. Remarks: Did not germinate. Weather unfavourable; drought for 3 months.

4. Mr. D. H. Verity, Middelburg. Sown August, 1905. Result, negative. Remarks: Seeds failed to germinate.

5. Mr. J. R. Meaker, Middelburg. Sown April, 1905. Result, indifferent. Remarks: Seed germinated badly. Sown on brack soil, slow growing; but if it will succeed, an excellent bush for these parts.

6. Mr. R. C. Holmes, Pearson. Sown not stated. Result, bad. Remarks: Not so satisfactory as other varieties. Plant very small, and dies off; not much food on it.

7. Mr. E. E. C. Christian, Cradock. Sown July. Result, indifferent. Remarks: Fed off by stock; followed by good rain; did not grow again, so don't think it will do on the veld in ordinary weather.

8. Mr. J. J. Hooper, Knysna. Sown Spring, Summer, Autumn. Result, fair. Remarks: Grows well on damp, brack soil, but not very well on sandy soil.

NOTES ON SOME SHEEP DISEASES OF THE NORTH WEST DISTRICTS.

BY F. H. WALSH.

Travelling through the above districts and enquiring about the most prevalent sheep diseases and the remedies used, one is confronted with a profusion, seemingly a hopeless profusion, of diseases, while the lack of proper remedies or preventive measures is often only equalled by the crudeness of the remedies employed. Krimpsiekte, Malkop, Dikkop, Vomeerziekte, Geelziekte, Dinziekte with their various symptoms were eagerly expounded by the sheep farmer, but in many cases the sum total of treatment surgical and chemical seemed to be represented by ear or tail slitting, a packet of dip, and a bucket of salt.

It appears also that a disease may spread over two districts and be known by different names in each. Further, while one farmer will maintain that a sickness is undoubtedly caused by the stock eating a certain plant, a visit to his nearest neighbour may result in equally convincing testimony that climatic and atmospheric conditions are alone responsible. Before going further, the practice of indiscriminately dosing sick animals with arsenical dip powders cannot be too strongly condemned. There is no doubt that many animals are lost through blindly following this method.

A dip used as a dip is a very useful article, but as a medicine in the hands of a thoughtless or ignorant person it may become very dangerous. A perusal of the "Correspondence" pages of the *Agricultural Journal* for a few years back, will reveal some amazing

Dip Cures and it would appear that in some hands an arsenical dip is a veritable panacea for all diseases from Lammziekte to Heart-water. A dip however, such as Cooper's Powder, may undoubtedly be of great use as a medicine, *when used in the right case*. As a dose for worms (one teaspoonful of dip to ten of salt; dose, one teaspoonful of the mixture) it is often very effectual, but in an outbreak of Krimpziekte where it was used in the same proportion it is not surprising that every animal so dosed died.

Those who are inclined to the use of arsenical dips as a stock medicine would do well to carefully consider the condition of the affected animals before so dosing. The effective ingredient is the Arsenic, and as a general rule, unless it is a case of expelling internal parasites such as wire worm, tapeworm, bots (paapjes), it is better to leave the arsenical dip powder severely alone.

Krimpziekte.—The exact cause of this sickness has not apparently been definitely decided yet, despite the efforts of the Government Veterinary Department. (1) At Eendekuil, Nieuwoudtville, Carnarvon and Britstown it was confidently asserted that the cause was a plant, (2) while at Calvinia, Sutherland, Clanwilliam and Fraserburg, equally positive opinions were given that it was caused by the condition of the veld or by certain atmospheric influences, such as morning mists.

It has been proved from experiments undertaken by the Agricultural Department (first by Mr. Henning and later by Mr. Pakeman) that a plant known as "Klimop" a tempting looking green creeper, when eaten in some quantity by sheep and goats will produce tetanic convulsions and later paralysis. (3) Undoubted cases of Krimpziekte have occurred however, on farms where no Klimop could be found. Here it was variously put down to the dry condition of the veld, grazing while the dew was on the herbage and the prevalence of morning and evening mists caused by the hot weather.

It has also been suggested that some fungus may be the cause of the sickness and on one farm where the sheep were affected, a small red fungoid growth on the bushes was certainly observed to be fairly plentiful. From the various and diverse symptoms described in some dozen different localities where Krimpziekte was said to have broken out, it would appear that two other entirely different diseases are sometimes erroneously decided to be Krimpziekte. Thus in the case of a farmer who cured several sheep and goats by simply starving them and slitting the ears, the sickness was probably nothing more serious than Stomach Staggers caused by overfeeding, especially as the veld was extra good after recent rain.

[* 1. This is now accepted as proved, the question yet to decide is are there more than one? 2. Mr. G Tomlinson made some positive experiments at Sutherland with a plant. 3. This is quite distinct from Krimpziekte or Nenta.—EDITOR *Agricultural Journal*.]

In such a case, the seat of the trouble being the cerebral vessels, bleeding would speedily relieve the animal, though a good dose of salts would also be effective. Again in a case where aperients had not even a palliative effect, there could be no doubt that, from the symptoms described, the sheep were suffering from Malkop or Hydatid Cyst on the brain. Some readers, who are farmers, may perhaps scoff at the idea of Krimpziekte, Stomach Stagers and Malkop being confounded with one another. They perhaps have not had the writer's opportunity of witnessing the typical circling peregrinations of an unfortunate Malkop Sheep, which had been successively dosed with dip powder, salt and Stockholm tar, and in addition had its ears slit.

SYMPTOMS OF KRIMPZIEKTE.

The symptoms of Krimpziekte are in reality very distinctive. The affected sheep or goat will first be observed to stagger about in its walk, gradually falling behind the rest of the flock. Later it will fall down suddenly, lie quiet a few moments and then rise and continue feeding. The next stage of the sickness is the convulsion stage proper. The head is pushed down between the feet and then jerked upward and backward, the legs doubled up and kicked out again. The animal may bound forward and fall stiff and inert. These convulsions may continue at almost regular intervals or for some time occur very frequently leaving the animal in an exhausted condition for a longer interval. In the former case, it appears that the animal usually dies, while the latter may develop into a form of paralysis from which it may eventually recover. Native herds state that a sheep may remain in the kraal for the night in a partially paralytic condition (the convulsions having ceased) and yet leave for the veld with the rest of the flock next morning.

Treatment.—First and foremost a brisk aperient. Three or four ounces of Epsom Salts (Magnesium Sulphate) in warm water is an effective draught. Having opened the bowels follow up with a sedative. Chloral Hydrate, Potassium Bromide and Soda Bromide have all been used successfully. Of these Potassium Bromide is perhaps the safest drug to use and has the additional advantage of being the cheapest. One to two drachms may be given or say a teaspoonful, with plenty of water. This dose may be repeated, if necessary, three times a day until the convulsions cease. Dr. Hutcheon advises that the affected animals should be as little disturbed as possible and kept separate from the flock in some place where they can get plenty of good water. There is no difficulty in carrying out the above treatment and those who have tried it are unanimous that Krimpziekte is curable if tackled and attended to in time. Turning to

MALKOP,

we have something of a very different nature. Symptoms: An affected sheep becomes stupid and nervous. It is very easily frightened and may jerk its head from side to side (not up and down as in Krimpziekte) as if trying to shake off something. Later it will be noticed that the animal holds its head on one side, and when feeding moves round in a circle, or at any rate grazes with a constant sidling movement in one direction. This animal is the helpless host of the middle stage in growth of the dog tapeworm (*Tenia canines*). Tapeworm eggs deposited on the veld in the excreta of dogs have been taken up by sheep while grazing or drinking. The eggs develop with the result that the embryo stage of the tapeworm, a hydatid cyst, is established on the brain. The cyst is a bladder like bag containing a white watery fluid. Starting between the divisions of the brain, it develops towards one side. The pressure on the brain, thus caused, makes the animal incline to that side while grazing. The only treatment possible is the removal of the cyst. This is a somewhat delicate operation, and few farmers may care to attempt it. Failing this, however, the animal had better be slaughtered at once and the head at least burned. Though rural opinion differed as to whether the carcase of a Malkop sheep was fit for food or not, medical opinion pronounces it extremely dangerous to eat the flesh. Although the cyst was found in the head the muscles of the animal may possibly also be affected.

If the cyst, it is easily located by the swelling, be punctured with a good sized trocar, and the contents drawn off by means of a syringe, the animal will be immediately relieved. Unless, however, the bag itself is removed the contents soon form again. Successful removal has been carried out by means of a fine pointed pair of forceps with which the walls of the cyst were torn away. The opening made by the trocar was then dressed and bandaged. It is, however, as stated above, a delicate operation in unprofessional hands.

This reduces us to preventive measures, so the sheep having been destroyed, the farm dogs may be next attended to and treated to a good purge all round. For killing tapeworm, Areca Nut, Santonin and Male Fern are all used, but the latter is the most effectual. Once a dog is found to harbour tapeworm either destroy it at once or start right away with a dose, otherwise the animal is a continual menace to the health of your sheep. Extract of Male Fern (Extract Filicis Mas. Liq.) is a thick, dark green fluid, of characteristic odour and taste. It may be obtained in gelatine coated capsules, but a good plan is to get the liquid itself and tie up each dose in a piece of sausage skin. Half to one teaspoonful on an empty stomach followed by a good dose of castor oil seldom fails to remove the unwelcome visitor. Should the male fern make the

dog sick, fasten his head up after dosing, so that he cannot get it down between his legs to vomit.

Treatment must be continued until the head of the tapeworm is removed. The parasite being bisexual, two segments not removed are capable of producing some 20,000 eggs. It is probable that at least 50 per cent. of the so-called "Kaffir Dogs" suffer from tapeworm. Preventive measure number two, then, is to keep the farm dog free of tapeworm.

The common practice of watering stock at dams of collected surface water or at small ponds filled from springs or pumps, is largely responsible for the spread of disease and parasitic life. It is a common sight to see stock watering at a small pond filled from a well of good water by a bakkies pump. Day after day animals walk into the pond and pollute it with their excreta, the water becoming daily more infected and dangerous. A dam naturally contains the sweepings of the veld, but by allowing the stock to drink at it, it becomes daily worse and worse.

The erecting of suitable water troughs is not a matter of great expenditure; and were every farmer in this country to give this matter his attention, much improvement would undoubtedly be made in the general health of all stock.

VOMEERZIEKTE, VOMITING SICKNESS.

This disorder which is well known from Carnarvon to Kenhardt is said to be caused by feeding on the vomeerbosje. Experiments undertaken by the Agricultural Department were not, however, successful in proving this bush responsible. Apparently therefore the cause of Vomeerziekte has also not been satisfactorily established.

Various theories have been advanced. That the bush must be eaten in large quantities, the poison accumulating in the stomach before coming into action. That it is only at certain seasons that the poisonous principle in the plant develops. That it is not the bush itself but some parasitic growth on the bush which is the cause of the sickness. That the bush may be poisonous only at certain seasons is very possible. It is well known that to obtain the full medicinal properties in some herbs, the plant must be taken at a certain season.

It is also possible that the Vomeerbosje when green and well nourished is innocuous, but when dry and suffering from want of water may develop some alkaloid or other active principle which causes the mischief.

Symptoms.:—The affected animal continually vomits with a husky cough endeavouring to swallow the vomit as soon as brought up. It will lag behind the rest of the flock, ultimately lying down apparently exhausted and disinclined to struggle further.

Treatment:—Some farmers have been successful in stopping the sickness by dosing with ash obtained by burning the Seepbosh. (A species of *Mesembryanthemum*).

The Alkali in the ash being the effective ingredient would point to some irritant acid poison being the cause of the sickness.

A good draught is

Bicarbonate of Soda, 1 ounce.

Tincture of Opium (Laudanum), 2 teaspoonfuls

in a pint bottle of water. When the violent vomiting has ceased a dose of salts in warm water should be given to remove the irritant matter from the animal's system. Purgatives should not be given as a first dose, the inflamed state of the animal's stomach making this proceeding somewhat dangerous.

GEEL DIKKOP.

The name Dikkop seems to cover a multitude of disorders. Malkop (Hydatid Cyst) sheep are sometimes described as suffering from Dikkop. In one case Dikkop was described as a swelling under the head caused by eating a bush with yellow flowers. Further symptoms were congestion and acute flatulence. Exactly similar symptoms (also said to be caused by eating the yellow flowered bush) were related in another case. Here, however, Geelziekte was the name given, from the yellow fluid which exuded from the punctured swelling. It seems highly probable that in both the above cases the plant Bietouw (*Hoplocarpha lyrata*?) was the cause of the trouble.

A tablespoonful of Sal Volatile (Spirit Ammon. Co.) with a teaspoonful of Tincture of Opium in about a pint of water is a useful draught in such cases. Falling the Sal Volatile use a small teaspoonful of powdered Ammonium Carbonate, the Ammonia used for cooking purposes. A good dose of salts will usually complete the cure.

This disposes of the abdominal symptoms but the swelling under the head leads us further afield. Fluke (Liver Rot) and Wireworm also produce a dropsical condition. The altitude and dryness of these districts do not favour the existence of Fluke which requires damp marshy land to develop in. The Alkali or "brack" deposits, so common in these parts, are an additional safeguard.

It was noticed, however, that on one Dikkop affected farm there were several vleis or pans of *fresh* water, round which the flocks grazed. As stated above, water is essential for the development of Fluke, one stage in the life of this parasite being passed in a small watersnail. Fluke produces at first a sudden fattening of the affected animals, the parasites acting as a liver stimulant. In time, however, the animals become poor and thin, arch-backed,

pot-bellied. Severe diarrhoea may set in and there is often a swelling under the head. Turpentine is said to kill fluke, but if the animal is badly affected it is doubtful whether any treatment would be of avail. Plenty of salt as a daily lick is the best preventive. Stock slightly affected, removed from the marsh ground or neighbourhood of vleis, may recover on a dry pasture and a daily dose of salt.

FOR WIREWORM

Dr. Hutcheon's remedy of Copper Sulphate is well-known and successfully used. Sixty large bottles (10 gallons) of water to the pound of Copper Sulphate is the strength recommended. Five ounces is the dose for a full-grown sheep (a half-bottle holds twelve ounces). Fast the animal for twenty-four hours before dosing and keep away from water the day dosed.

DINZIEKTE.

Chronic diarrhoea causing the sheep to waste away until a mere bag of bones. Reputed causes are again various. Feeding on very dry veld, and the exact opposite, on young grass after rain, were two opinions advanced. In one district where the veld was very dry and diarrhoea had broken out it was called Geelziekte on some farms and Dinziekte on others.

Local remedies are tobacco and alum. The latter is safe to use and fairly effectual. A good aperient forms the safest groundwork for further treatment, and, having dosed with salts, astringents may be given. Tincture of Catechu and Laudanum in equal parts, dose two teaspoonfuls, to a tablespoonful of the mixture, is a well-tried remedy. The dose may be continued three times a day until the liquid motions cease. Lambs suffering from diarrhoea may be dosed with Bismuth or Chalk, if still sucking give a teaspoonful of Magnesia in a little milk.

BRANDZIEKTE OR SCAB

is unfortunately too well known to need any description, while a bulky volume might be written on the merits and demerits of the various dips. Much has been heard from time to time concerning the inability of the North-Western farmer to dip on account of the scarcity of water. The old saying of "where there's a will there's a way" has something to do with the case. A knowledge of what a bakkijs pump can do is apt to make the visitor sceptical.

THE ORGANIZATION OF AGRICULTURE.

Farmers' Associations and the Divisional Councils.

BY "AN IMPARTIAL OBSERVER."

Now that well-directed efforts are being made to organize agriculture and place it in the leading position it should occupy in a country, the useful purpose served by the various Associations of Farmers, Fruit Growers and others, is generally admitted and the question presents itself whether these institutions should not themselves receive some re-organization and recognized status, instead of being, not infrequently, regarded by those with whom they may come in conflict, as a set of irresponsible busybodies. Obviously when it is taken into consideration that some associations have, with brutal frankness, stated that the object of their formation was to see that government officials and others did their duty, a certain amount of antagonism must have been called forth and no doubt the aggressive tone sometimes adopted, if it had not the desired effect of making an official "sit up," certainly was enough to make a venerable one "get on his hind legs" and snort with annoyance at new fangled institutions.

Members of a Farmers' Association are almost without exception road-rate payers, voters for Parliament and the Divisional Council and the incidence of taxation falls on them as well as on the rest of the community. It follows that their representations should be met with more than a good natured indulgence or a courteous "choking off" and it is as illogical to regard the members of these institutions as irresponsible as it is to suppose that a number of men leading busy and active lives would assemble regularly merely to make themselves obnoxious.

In the scramble for the trade to the mining centres the general government as railway carriers has joined hands with the importers as suppliers, and there has, consequently, been a woeful neglect of the interests of the producer, who has found himself compelled to bring his claims for consideration forward, hence the number and rapid increase of Farmers' Associations and the organizations which have sprung from them, such as the Wool and Mohair Growers, Lucerne Growers, Western Province

Horticultural Board, Eastern Province Horticultural Board, Ram Breeders' Association, Vine Growers' Association etc., and there may be room for a Horse Breeders' Association, Ostrich Feather Growers' etc., so that each branch of agriculture will have full and undivided attention by those particularly interested in it.

THE AGRICULTURAL "GALLERY."

This may be said to be catered for by the Agricultural Union and its Agricultural Societies, with their Annual Shows. There are also the Annual Congresses of the Union, Farmers' Associations, Horticultural Boards, tours and lectures of experts and specialists, with an intermediate conference or two thrown in. The press contains full reports of all that takes place so that scarcely a week passes, but public attention is directed to one or another phase of the topic, and the general public may well be pardoned if they wonder whether the whole country is not going on an agricultural racket. Many are undoubtedly getting "fed up" with the subject and shy at anything relating to it with the same terror that a patient medicine "fake" inspires.

CENTRALIZATION.

In the course of time it may be possible to acclimatise and produce anything under the sun in the Cape Colony owing to its diversified natural characteristics and climatic differences. It follows that the numerous societies, having agriculture as the reason for their existence, spread over so large an area must have some means of working together, for there is only one Parliament for all. This end is at present attained by an annual congress of which the Agricultural Societies, Farmers' Associations and Horticultural Boards each hold one, consequently an overlapping is inevitable and a conflict of opinion obvious, often with detrimental consequences. Nor do all subjects meet with the same sympathetic treatment which a broad-minded desire for the general welfare of the country should inspire. It is but too evident that the wool grower is not interested in "dodder" in lucerne, and the lucerne grower in the extirpation of "burrweed;" the Karroo farmer in the eradication of ticks and the Coast farmer in the extirpation of prickly pear. The ostrich farmer probably does not know what "red scale" is and the citrus grower cares nothing about "bars" in ostrich feathers and so on.

One Agricultural Congress, about the middle of the recess, at which every branch of agriculture would be represented would have a far greater educational value and more far-reaching effects but each class of producers should deliberate separately, lectures and demonstrations could take place and in view of the large number attending, a week could be devoted to discussing

matters. Another advantage of having only one congress is that "mixed farming," which may include everything from raising an egg to breeding a thoroughbred horse, is necessarily much followed in fact almost the rule and once the congress disperses, the farming community would rest assured that their minds would not be distracted from their avocations to which they could give full attention by means of their local associations which meet generally once a month.

THE IMPORT TRADE.

In addition to having a community of interest, as railway carriers, with the importer, the general Government has a far greater interest with him as a collector of customs revenue on his oversea imports of products, which should be and are produced in the country. But that the arrangement is an amicable one is far from being the case, as the Government in its desire to protect the producer and at the same time to obtain revenue with which to carry on the administration of the country, falls foul of the consumer, and a hungry man is an angry man, consequently it is literally between the devil and the deep sea. And in the endeavour to reconcile the conflicting interests of the producer, consumer and importer the country is kept in a perpetual state of turmoil so inimical to progress, especially as the question is an interstate one.

Now that the country is face to face with a lasting depression owing to the deflection of much of its trade to Natal and Delagoa Bay, it is too late in the day to say that had agriculture been fostered when the railways released enormous numbers of draught animals from transport, this Colony would have been independent of foreign railway earnings, and the huge import trade of articles which could be produced in the country kept within reasonable bounds. Anyone can be wise after the event, and the fact remains that agriculture was *not* fostered, so it is best to "buck up" and see in which way the lee-way can be made up most rapidly.

FARMERS' ASSOCIATIONS.

The different organizations which the necessities of the producer have called forth have already been mentioned, but the writer wishes to confine his suggestions to the ordinary farmers' associations—call them "common or garden" if you will—existing in a division, and the best means to have them officially recognized so as to utilize them to their full scope in advancing agriculture. The members of these institutions take themselves very seriously, and devote a good deal of time and thought to the objects they have in view; but there is no doubt that in the past their representations, as expressed by resolutions passed at the annual congress, have not received that attention their vital interest demanded, and this has gone a long way to minimise the value of united action.

Nevertheless, the advantage of having a number of workers united in a common cause must be acknowledged by all thinking minds, and it is to the interest of the State that these efforts should be recognized and well directed.

When there is but one association in a division the membership may be large, but, owing to the long distances some members must necessarily travel, the attendance is but perfunctory, soon leading to a lack of interest. It is, therefore, an advantage when different localities establish an association. But there is one drawback that the different associations in a division may work at cross purposes, or else cover the same ground and entail an unnecessary amount of correspondence and attention. To overcome this difficulty in some divisions where there are more than one association, it has been found necessary to form a central committee, on which each is represented by delegates, to deal with general questions affecting the division, but leaving each institution free to deal with its purely local questions. Of course this arrangement entails extra attendance upon the delegates, who may have many calls on their time, and it is desirable that a simpler arrangement should be brought about. For this purpose the machinery exists in the Divisional Councils, of which the associations are ratepayers, and whose members not infrequently provide a member for the Council; in any case, they are represented on the Council by a member for the Divisional Council district or districts over which their membership or sphere of influence extends. And did they but call themselves Road Ratepayers' Associations, they would probably receive better recognition, but the title is not one which commends itself. Certainly, municipalities have ratepayers' associations, but these generally meet only when they have a grievance to ventilate, and it is not long before they become irate payers. The term farmers' association is on the whole comprehensive enough to embrace everyone raising produce; and it should suffice to remember that they are rate and taxpayers, as well as enfranchised, to entitle their representations to official recognition, both by the Divisional Council and the Government. The point would not be laboured, but there have been instances in which an association's representations have been ignored and it has been found necessary to attain the same end by the voice of the same meeting as ratepayers.

THE CIVIL COMMISSIONER.

Hitherto Associations have been left fancy free to obtain their ends as they thought fit, and have indiscriminately addressed any Government department whose province they might consider it to be to attend to the matter at issue. This method of conducting public business should be discouraged, for not only does it often entail a long delay, owing to the report of the Civil Commissioner having to be called for, but it is subversive of all discip-

line that the local representative of the Government and head of the division should be ignored by carrying on without his knowledge a correspondence on matters affecting the division over which he presides. The remedy is very simple and easily brought about by informing all associations that all public communications must be addressed to the Civil Commissioner, who will either forward them to Government, or submit them to the Divisional Council if it is a matter which he cannot dispose of himself. Another advantage of matters passing through the hands of the Civil Commissioner, is that they are officials of such wide experience and knowledge of the conditions of the country, and consequently, in a position to supply the heads of departments with valuable advice on any point which may crop up, seeing that the latter have, as a rule, gained their knowledge of the conditions of the country, within the four walls of a Cape Town office.

THE DIVISIONAL COUNCIL.

For the benefit of the uninitiated, it may be necessary to briefly outline the inception and functions of the Divisional Councils, seeing what a strong family likeness there was to them in the abortive Agricultural Bill, which was regarded with such dismay by a large majority of the farming community. Indeed, it cannot but be regretted that the time and thought devoted to the bill in question was not expended in bringing Divisional Councils up to date, and rehabilitating them in public favour, considering the vast number of beneficial enactments affecting agriculture which are entrusted to them to enforce, and which would still have been left in their hands. In the year 1855 certain boards were established in the several divisions of the Colony, for the better administration of their local affairs. These boards, consisting of six members elected by the registered voters in the respective divisions were styled Divisional Councils and exercised originally, amongst other duties, control over *branch roads only*. In 1865 the various acts relating to Divisional Councils were consolidated. Divisions were divided into six Divisional Council districts, and the number of members increased to eight, the Divisional Council district in which the Civil Commissioner's office is situated returning three members, and the other five districts one member each. The Civil Commissioner of the division is *ex officio* a member of the Council, and when present presides at the meetings.

Divisional Councils have now control of all roads whether main or branch, *but must keep the expenditure separate* (the italics are the writer's). By subsequent legislation, principally of a beneficial description, contained in upwards of seventy or eighty enactments, the powers and duties of the Councils were greatly extended, and their functions as regards the farmer now embrace matters so remote from each other as taxing his dog and protecting his (the farmer's) health.

Those acquainted with the high position these Councils once held in the public esteem must marvel to what set of circumstances must be ascribed the fact that they have gradually declined in public favour to such an extent that they have become a bye-word in the country, and their abolition has been seriously mooted not only at a Congress of Mayors, but also at the Congress of Farmers, the very men whose weapon it is for the protection of their interests, being in fact to them what the Municipal Council is to the townsman. Undoubtedly many of the matters which ought to be attended to by the Councils now receive attention from Farmers' Associations, who have gradually usurped their functions with the disadvantage of not having the powers to enforce or carry out their object, and can but recommend, hence the frequent repetition of "Congress re-affirms the principle, etc., etc.," appearing in the reports of the proceedings. It would be more effective if the Congress, through the delegates, brought pressure to bear on the electorate and Parliament by means of the Councils, who are representative of the whole farming community in a division, and to this end the various Farmers' Associations are a ready means.

TOWN AND COUNTRY.

The truism that the interests of the town and the county (*i.e.*, townsman and farmer) are identical is so obvious that one wonders at its frequent reiteration, and it would indeed be a strange community in which the interests of the component parts were not identical. It is a significant fact that the question does not obtrude itself in the district towns with a local trade, and in these one does not hear so much of the present depression. The fact appears to be that in the scramble and rivalry for the trans-colonial trade everything else was allowed to slide as too insignificant to demand attention, and so it probably is considering the sparse population, but it is there to stay, and the trans-colonial trade is here to-day and there to-morrow, and keeps everyone at loggerheads.

ROAD RATES.

No doubt the townsman with valuable landed property—not infrequently of the white elephant description—feels indignant that he should pay both Municipal rates and Divisional Council road rates, and jumps to the conclusion that he is paying the latter for the benefit of the farmer, who produces so little that oversea products are to be relied on for existence. But the contention will not bear investigation, for the simple reason that the townsman can only carry on his trade if he has the medium to distribute his imports, and where railways are non-existent the only means of doing so is by wagon transport conveyed over the main roads. It has already been mentioned that the expenditure on main and on

branch roads is kept distinct, and if the expenditure were allocated according to the source from which derived, *i.e.*, whether paid on town property or country property, it will, in nine cases out of ten, be found that not only do the main roads absorb the amount contributed by the townsman, but a large proportion of that paid by the farmer. Admittedly the latter makes use of the main roads, which are the arteries to reach the towns by means of the branch roads, which seldom even receive attention on the score of lack of funds. The fact is recognized that the townsman pays the largest share of the road rates, and for this reason *the town* is represented on the Council by three members.

Railways.—In a country producing more anomalies than anything else it is not to be wondered at that one exists as regards railways. It is this that, after no inconsiderable amount of log-rolling, often of a most acrimonious nature, the importers who clamoured the loudest for the extension, distribute their imports by means of transport wagons to the extent of supporting a disastrous competition with the railway and the damage of the railway system which has to contend with it against rival ports—one fails to see therefore on what grounds the townsman demurs at paying road rates.

Wagon Transport.—Before the mines were linked to the seaports they depended upon wagon transport for their supplies and, indeed, existence; and some of the best men in the country were employed in the transport industry and in no small way contributed their share to the development of the mines. But that belongs to a past day and with the extension of railways in all directions transport riding, where railways exist, is an unmitigated evil, in more respects than one, for not only is a disastrous competition with the railway kept up and contagious diseases spread amongst cattle, but the Europeans engaged in it are on the high road to insolvency as the rates paid, owing to native competition, are insignificant compared to the risks run, and the margin of profit, if any accrues, merely suffices for a bare existence. In the interests of the country and those engaged in it, it should be discouraged with a firm hand.

MAIN ROADS.

These are in the first instance constructed by Government and when completed, taken over by the Council which has to maintain them in proper repair. The cost of doing so and the extravagant system necessarily in force, is a severe drain on the pockets of the ratepayers of a division, in many instances, for which they receive no benefit. The time has undoubtedly arrived for an alteration to be made. The most feasible plan seems to be to abolish a main road in a section served by a railway and maintain it as a branch road, charging a heavy toll on transport wagons pure and simple competing with the railway, but exempting rate-

payers conveying their own produce or carrying imports for ratepayers in their own or a neighbouring district on their return journey, as by so doing they minimise the cost of marketing. In districts where railways are non-existent, the Government should relieve the Councils from the maintenance of main roads on condition that they devote their attention to branch roads, and the carrying into effect of existing beneficial legislation, such as the Animals Diseases Act, Locations Acts, Scab Acts, and others, not forgetting the destruction of locusts and noxious weeds. Once the principle is admitted, the ratepayers will, through their farmers' associations know the why and wherefore if matters are allowed to slide, by carpeting the representative of their divisional council district or districts and it is a simple matter to "fire" him if he neglects their interests, now the majority of [ratepayers meet monthly at their farmers' associations.

SELF-RELIANCE.

The country has become so accustomed to the platitudes indulged in at the frequent congresses which take place that a change is desired. No doubt the loquacity of the speakers raises a certain amount of enthusiasm in those present, but to those acquainted with the general state of the country and in cold print the perorations read uncommonly like what is vulgarly called "old buck." It would be infinitely more interesting if in future vital and reliable statistics were submitted by each branch represented at the congress, shewing the progress of the country, either backwards or forwards, during the year, and thus a wholesome rivalry become established and lead to an influx or release of the capital so much needed to advance agriculture.

It was indeed refreshing to see that at a recent opening of a congress the minister entrusted with the destinies of Agriculture impressed upon his hearers and through them the country that they must rely on their own efforts to advance.

Now that the country is in "Queer Street" one reflects upon the rack rent the lease of the Treasury benches entailed upon it in the past when ministers kept everyone pacified—a Railway here, harbour improvements there and a general wet nursing of the producers until the consumers have got in the habit of applying the standing reproach to the farmers that they expect the Government to do everything for them. An autocratic ruler would have resisted the impulse to rush railways through a foreign state in order to collar the carriage and customs it produced and devoted his energies to raising products for export to the same state. However, it's no use repining, and best to take the lesson of the past to heart so as to get a move on. It is a self-evident fact that there are always a number in a community on the prowl to get something for nothing and if they can get it from Government they

demand it as a right, instead of regarding it as a favour. They are too dense to see that it comes out of their own pocket for they do not realise that the government is the people. Of course the case is aggravated when one section of the community is benefited at the expense of the other, of which perhaps the Scab Acts are the most notorious instance. Autocratic rule is beyond the range of practical politics, but responsible (with a small *r* please) government can be made a good substitute by the people themselves taking a broad view of their responsibilities and realizing that in the general prosperity of the country their own individual interests are involved.

THE SCAB ACTS.

It is twenty years since the urgent necessity of saving the wool industry from extinction by the ravages of Scab, was forced upon all enlightened men, who had the example of Australia before them, not only of the possibility to do so, but of the certainty that it could be done, at all events to the extent of becoming a minus quantity in the wool market. But the ministry of the time had the historic instance of their predecessors being scared off the Treasury benches by the Australian bug, a not very ferocious insect and one whose ravages were nothing compared to that of the "acarus" or scab insect. And whether they had the advice of the Gold Coast Natives, who say "Softly, softly, catchee Monkee" in mind or not they set gently to work—in fact very gently. The first measure was a permissive one and the onus, if the term can be applied to a beneficial action rested upon the Divisional Council to put the Scab Act in force in its division. If the writer's memory serves him correctly, it was even possible merely to put the Act in force in a single fieldcornetcy or Divisional Council district. However, the principle of a compulsory measure had to be admitted and ultimately the present emasculated Act was foisted on the country and the ministry responsible for it breathed freely again.

Why it is incumbent upon the successful and enlightened wool and mohair growers—the terms successful and enlightened are used in preference to "progressive" which has a political significance, whereas men coming under the first mentioned category are to be found in the ranks of both political parties—to take the lead in setting an example of self-reliance is because after an expenditure of upwards of a million, an annual outlay of between £60,000 and £80,000 to eradicate scab, to say nothing of police and jackal tails, is beyond the resources of the country, which is after all contributing only about 3 per cent. of the wool supply of the world and cannot, therefore subsidise any individual industry to the extent mentioned. The Scab Acts should therefore be abolished and some more economical though comprehensive measures be resorted to for which every condition exists.

According to the latest returns out of 20,400,000 sheep and goats 19,500,000 were free from Scab leaving 908,500 or a trifle over 4 per cent. under orders to cleanse. Now four per cent. is a very small percentage to write off for depreciation on running machinery and even if the throats of the infected flocks had been cut and their carcasses sold, it would still have been a sounder commercial principle than an annual outlay by the general Government to see that part of the constituents attended to their business and kept their flocks flourishing.

PREVALENCE OF SCAB.

Even in countries alleged to be free from Scab it is asserted that sources of contagion still exist and will in fact always exist. Each individual has the remedy in his own hands, now that fencing has been extended to limits never dreamt of when the Scab Acts were first introduced, to keep his flock from contagion. That dipping can ever be dispensed with is absurd for although it is the "bugbear" of the Cape farmer there is evidence to shew that Australians consider it to enhance the value of their wool by 1d. to 2d. per lb., by the improved condition of their sheep, when they are ridded of ticks and lice.

THE WOOL-GROWER.

The tacit partnership between the Government and the importer has been incidentally alluded to and it might be interesting to see where the consumer, exporter, middleman and others come in, but in the meantime the wool-grower claims more than passing attention, seeing, as already mentioned, to what extent he has been subsidized by the country. It is a significant fact that in the tirade, which has latterly been going on against Cape wool, no allusion is made to the presence of scab in it. It may, therefore, be taken that the expenditure on its eradication has not been in vain. But now, at the eleventh hour, when scab has been reduced to four per cent., the wool-grower has to be taught the A B C of his business of marketing his produce by ocular demonstration. Surely, amongst his number there are men of enlightenment and education, capable of setting him an example, if only for their own protection, as their products are indiscriminately submitted in the same market, and one would ask them what business they would expect a street hawker to do with the cry "'Murikan tin meat.'" They have probably not sampled the stuff, but, apparently, a bale of "Cape wool" contains as many hidden mysteries as a tin of meat, and is approached with the same suspicion.

WOOL AND MOHAIR GROWERS' ASSOCIATION.

Enough has been said to shew that the members of this institution may safely be left to work out their own salvation, but it will

be contended they have no *locus standi* to enforce laws! Quite so, but they are all ratepayers to the Divisional Council, and if the Scab Acts are repealed, and scab treated as a contagious disease, falling under the Animal Contagious Diseases Acts, the Council can see that the law is put in force. Besides, there is the strong moral influence which has had to be depended upon for the suppression of other animal diseases, entailing far greater loss than scab.

INSPECTION OF STOCK.

It is not for a moment suggested that, after "bossing" a section of the producers up for twenty years, they should suddenly be left to their own devices, especially as they are the only ones who can provide some freight for the shipping lines carrying the country's supplies, and adding a floating population to the number of much-needed consumers, and more especially as other stock can no longer be allowed to get along the best way they can. The country has at its disposal a veterinary staff, the members of which are distributed over the country, but, owing to the absence of organization, these men of high professional attainments as often as not have to cool their heels in the town of their centre, waiting for something to turn up, or otherwise they are bucketed from pillar to post at the beck and call of any one with a sick animal—as often as not the victim of mismanagement. The country can hardly afford to keep a staff of professional men to tell A that the "fool-proof" qualities of his horse's stomach are extremely limited and cannot stand the quantity of nostrums he has poured down its throat—often *via* the nostrils; or B that it was very enterprising to grow lucerne for his cows, but that he ought to have known that he would lose them if he turned them in hungry and let them eat till they burst. A methodical inspection of all stock in the country is absolutely necessary, and this can readily be combined with the inspection of roads. In fact it is on the roads where the greatest sources of contagion exist, and men can be found to carry out both without any additional expense to the ratepayers; as a matter of fact the road parties are ever present there.

LOCAL SELF-GOVERNMENT.

Enough has been said to shew that in the Divisional Councils the instruments are ready to hand to extend local Self-government in the country to the same extent as in the municipalities. Already under the Loans Act the Council is the local authority for loans for bridges, &c., and the principle might be extended to depôts, and, in fact, fencing or anything, for the benefit of road ratepayers, and if Agricultural Banks are established, no one would be in a better position to administer their affairs, as the members of the Council would be conversant with the position of every borrower, and the purposes for which the loan was desired to be obtained.

Of course, changes would be necessary to be made by the Legislature to give effect to the Council taking on increased responsibilities.

Farmers' Associations are purely voluntary institutions, and should remain such. If any financial aid is required by them, it should come out of their own pockets *via* the Divisional Council.

In conclusion, it is hoped that nothing which has been written will be regarded as criticism. The suggestions have been made in the hope that they will be of assistance to the earnest efforts which are being made to raise the wind to speed the "old wind jammer" of a ship of state out of the "doldrums" where she has been wallowing so long, and that she may reach a port of agricultural prosperity by

"AN IMPARTIAL OBSERVER."

Gonubie, Oct. 15.

THE PRESERVATION OF GAME IN CAPE COLONY.

BY G. N. WILLIAMS.

The important subject of Game preservation has received the attention of the authorities from a very early date in the history of the Colony, various *placaten* having been issued at frequent intervals during its earlier years from a date shortly after the colonisation by Van Riebeeck. The Dutch East India Company were fully alive to the importance of preserving the herbivorous fauna of the country, and in fact during the earlier years of the settlement no one under severe penalties, was allowed the privilege of hunting, the pursuit of the game being confined to the Company's two hunters. As the Colony expanded of course these restrictions were modified, but persons desirous of hunting were obliged to obtain licences for that purpose.

Such legislation as was contained in these *placaten* was, however, merely designed to meet particular needs from time to time, and in 1822 the need of a comprehensive amended law resulted in the issue of a proclamation by Lord Charles Somerset, then Governor of the Cape, consolidating and amending the existing laws, and, *inter alia*, constituting a close season for game, providing for the issue of licences for its hunting or pursuit, and enacting that in respect of certain of the larger species of animals, commonly known as Royal Game, a special permit from the Governor should be obtained before they could be hunted, captured, etc. This

proclamation remained in force until 1886 when, owing to a variety of causes, among the principal of which were the expansion of the Colonial boundaries and the denser population of the various districts thereof, the improvement and cheapening of firearms, improved facilities for travelling, etc., it was found that the destruction of game was proceeding to such an extent that in many cases their extermination was a mere matter of time and in fact had in regard to some of the slower moving species such as the eland and hippopotamus already become an accomplished fact. As the existing legislation was insufficient to cope with the evil, a comprehensive Game Law, Act No. 36 of 1886, was adopted by the Legislature and, with certain additions and modifications imposed by the subsequent statutes, Acts Nos. 38 of 1891 and 33 of 1899, remains in force until this day. As a certain amount of misapprehension would appear to exist as to the exact position of the public in regard to these laws a short explanation of their principal points seems desirable.

The Act of 1886, after repealing all previous legislation, defines the animals and birds included in the term "Game," which are as follows:—paauw, korhaan, guineafowl, pheasant, partridge, grouse and dikkop, elephant, camelopard or giraffe, hippopotamus, buffalo, zebra, quagga, Burchell zebra, the whole of the antelope species and the hare or rabbit (not being coneys): for the hunting of any of these animals a game licence is necessary, a landowner, however, does not require a licence for the purpose of hunting on his own land. In respect of royal game, viz.: the elephant, hippopotamus, buffalo, eland, koodoo, hartebeest, bontebok, blesbok, gemsbok, rietbok, zebra, quagga, Burchell zebra, and gnu or wildebeest of either variety, in addition to the game licence mentioned above a special permit must be obtained from the Governor, and failure to comply with this requirement entails a very heavy penalty. It may be as well to briefly explain the procedure in connection with these special permits. It must be understood that they are granted very sparingly, having regard to the numbers of big game which may exist in a district. Preference is, of course, given to landowners, particularly to those who endeavour to preserve the game on their property. Application for permits should be made to the Civil Commissioner of the Division concerned and should state the name of the farm whereon it is desired to shoot and should the applicant not be the owner of the farm, should be accompanied by the written consent of such owner. The Civil Commissioner forwards the application to the Secretary for Agriculture in whose hands the granting or refusal of the permit lie. If granted, the permit is issued to the applicant through the Civil Commissioner, the applicant is required to give notice to the Civil Commissioner of the date upon which he proposes to avail himself of the permit and after use to return it to the same official.

The only exception to the law that a special permit must be obtained for the destruction of any of the royal game mentioned above is in the case of elephants trespassing upon private property, a landed proprietor or person authorised by him may shoot elephants so trespassing upon his own property without obtaining special permission.

While upon the subject of game licences it may be as well to mention a very widely spread misconception which has arisen on this point; the law states that no licence shall be necessary for the killing of game found injuring crops in cultivated lands or gardens, this has been interpreted as meaning that game so trespassing may be shot in the close season. This, as the law at present stands, is most emphatically not the case. Game may not be shot in the close season on any grounds whatever, save with the Governor's consent, and provision for shooting on this account does not exist.

This exemption from licence must not of course be understood to imply, in the case of Royal Game, an exemption from obtaining the Governor's permit. This, as above stated, must be previously obtained, except in the case of elephants.

Many people also imagine that, having obtained a game licence, they are thereby entitled to shoot on Crown Land. This idea is quite erroneous. A person has no more right to shoot on Crown Land without permission than he has on private property and severe penalties exist for doing so. Should the holder of a Game Licence desire to shoot on Crown Land he should make application for permission to the Civil Commissioner of the Division wherein such land is situated except in the case of Demarcated Forests, the control of which vests solely in the Forest Department.

The following are the requirements of the law :—

To shoot game on private property no licence is required by the owner but must be held by other persons; to shoot *royal* game all persons, whether owners or otherwise, must hold the Governor's permit, and to shoot on Crown Land, in addition to the ordinary licence in the case of all game, and, in the case of royal game, the Governor's permit, the specific permission of the Civil Commissioner must first be obtained. A further requirement of the law is that for the sale of game a special licence must be taken out for that purpose—such licence is not, however, required by a landowner selling game killed on his property.

The law further provides for the establishment of close seasons for game (these seasons have been arranged in groups of contiguous districts, regard being paid to similarity of climatic conditions) and also for special protection when deemed necessary, for a term of years not exceeding three. Full particulars on these points are published by the Department of Agriculture in the January or February numbers of the *Agricultural Journal*, and reprints thereof can be obtained from the Department at a nominal charge

of 3d. per copy. Power is also vested in the Governor to extend the protection of the Game Acts to any bird or animal other than those defined as "game," for the suspension of the Acts in any Division where such action may become necessary, and for the issue of special permits for the removal of eggs of game birds or the capture of young of game, provided such removal is for the purposes of rearing, breeding, acclimatisation or scientific investigation. Without such permit such removal or capture is contrary to the law and is subject to a penalty.

Another provision of especial interest to farmers is that dealing with unauthorised shooting on private property, its contents are briefly as follows :—

The owner (for the purposes of this provision the term "owner" embraces the "occupier" or person holding shooting rights on the property concerned) shall give notice of his intention to preserve his game, either in the *Government Gazette*, a local newspaper, or personally or by letter, and any person thereafter hunting or pursuing game or trespassing with dog or gun on the property shall, on conviction, be liable to a fine not exceeding £5 sterling for the first offence and not exceeding £10 for any subsequent offence, such penalties to be paid to the owner of the land. (For purpose of reference it may be stated that this provision is contained in Section 7, Act. No. 36 of 1886.)

It may be noted also that it is a punishable offence for any person to be in possession of game after the expiration of a week from the opening of the close season of the district in which he is located unless he can satisfactorily establish the fact that such game was transmitted from a district in which at that time the open season was current. It is also competent at any time for a Resident Magistrate or other authorised official to call upon any person found in possession of the flesh, skins, hides or horns of royal game to show how he became possessed thereof; and failure to give a satisfactory explanation renders such person liable to the severe penalties provided in regard to shooting royal game without a special permit.

By the Act of 1899 the Governor was empowered to establish game preserves and make regulations for the working thereof, in pursuance of which a large area has been set aside in Namaqualand, in which large numbers of gemsbok and wild ostriches are to be found.

These are strictly preserved and permits for their destruction are on no account issued.

Generally it may be said that the working of the Game Acts has been attended with a very fair measure of success, certain species which 20 years ago were threatened with extermination having increased in a very gratifying degree. Still experience has shewn that various additional provisions on the one hand, and alterations or modifications of the existing law on the other hand

are necessary, and steps are proposed to carry these into effect at an early date. The depredations of poachers in the remoter districts of the Colony and the numbers of dogs kept by Natives with which the smaller antelopes, etc., are run down, demand attention, and in view of the immensity of the country and the comparatively small number of police it is difficult to bring offenders to justice. The Government has, therefore to look largely to landowners for support in enforcing these laws and it is gratifying to acknowledge the amount of support which it receives in this direction. This support is, however, capable of a great deal of expansion, and would be rendered of far greater material value if a few more convictions could be obtained. There is, of course, always a natural distaste towards lodging information against anyone contravening the Game Laws but it should be realised that in giving information likely to assist in the apprehension of offenders one is performing an important public duty, and assisting the ends of justice where they would otherwise probably fail.

Representations have often been made, doubtless with very good grounds, as to the damage wrought by game, particularly the smaller species of the antelope family, in vineyards, crops, etc., but, on the other hand, the possession of a good stock of game on a farm cannot be regarded otherwise than as a valuable asset; for instance, it provides an agreeable change of diet during the open season; and, in some parts of the country, game either fresh or in the form of biltong forms a most important portion of the household provisions. Without proper protection and observance of close seasons the game would rapidly become exterminated and this benefit would be lost. Another item which may, and, in some instances, already has, become an important financial benefit to the farmer is the sale or lease of shooting rights. In Europe and America very large sums are paid by wealthy individuals for such rights, and it should be borne in mind that it is not only the sum actually paid for these rights that will benefit the farmer, but he will most likely be able to dispose of large quantities of farm produce, such as meat, poultry, eggs, butter, fruit and vegetables, at advantageous prices, to the lessee and his friends.

Another benefit conferred on the farmer by the protection of game is undoubtedly the service rendered by game birds in the destruction of insects, and, in this country with its variety of injurious insects, this must surely be of inestimable advantage. It is reported that in the Karroo districts the korhaan is strictly preserved by many farmers on account of the good service rendered by it in this direction, with most beneficial results. This service is of course not confined to game birds, and, in fact, owing to their greater numbers, must be rendered in an even greater degree by the non-game birds of the country, as for example, the

locust birds and many others which must be well known to every farmer, and they, although not enjoying so great a measure of protection by law as is accorded to game birds (protection being only accorded to non-game birds in such areas in respect of which application is made through the Municipal or Divisional Council in terms of the "Protection of Birds Act, 1899") are equally entitled to consideration, and their wanton slaughter should be repressed as much as possible.

There can be no doubt, also, that the existence of the game laws must prove of benefit to farmers, inasmuch as they, to a certain extent, act as a deterrent of trespassing. Were game unprotected, and their indiscriminate destruction consequently permitted, there is no doubt that persons would unhesitatingly commit acts of trespass in their pursuit, whereas the existence of the game laws adds greater elements of risk of punishment to a person pursuing game, and thus renders such an act less likely to be consummated and removes a great incentive to trespassing.

On the whole it may be said that good reasons exist to prove that effectively administered game laws, although, perhaps, sometimes somewhat annoying to the individual, are of distinct benefit to the farming community at large (even if the financial advantages above alluded to are not apparent in the present, there can be no doubt of their possibilities in the future), and there is, therefore, every reason to solicit their unremitting efforts to assist in carrying out the law, with a view to the detection and conviction of poachers, who, it is to be regretted, despite the vigilance of the authorities, continue to carry on their depredations on a very large scale.

In regard to what has been said in this paper as to the probability of the game becoming a source of revenue to the farmers, should their preservation be effectually continued, it may be interesting to notice a few facts regarding the State of Maine in the United States, a country which is not blessed with nearly so many varieties of game as our Colony. In 1904 a sum of over £5,000 was collected in licence fees from non-residents visiting the State for sporting purposes, 1,942 guides were employed, earning during the season something like £6,200, which, of course, meant increased circulation of money in the State. Further statistics for 1904 are not available, but in the year 1902, 133,800 non-residents visited the State during the sporting season, disbursing over £270,000 for board alone, besides other very large sums for incidental expenses. When to this is added the amount covered by their railway fares, and other means of transport, it is easy to realise what a source of profit the game may become, if due care is paid to its preservation. Of course, in a country like South Africa, where the moneyed class is comparatively few in numbers when contrasted with the United States, such great results could not be expected, but still there is every reason to suppose that, given an increase of game by means of careful protection and the destruction of vermin, the time will

arrive—particularly in view of the interest in South Africa which has been awakened in Europe of recent years—when farmers in game districts may confidently expect a substantial addition to their pecuniary resources by letting their shootings, and they will, of course, indirectly derive benefit in other ways on account of the increased circulation of money in their districts.

It may be mentioned that in America much good work has been accomplished at a minimum of expense in the direction of improved protection of game, by means of "Farmers' and Sportsmen's Associations," and as an instance the Rockford Farmers' Association in Illinois may be selected. The chief points of association are briefly as follows: Each member is required to post notices in four or five conspicuous places on his land, prohibiting hunting, shooting, or trespassing, and in case of his discovering any person so hunting, shooting, or trespassing on the property of any member of the association, he is pledged to take the necessary steps for apprehension and punishment. Each member reserves the right of granting permission for hunting and shooting on his own land, and pledges himself to assist in promoting the rigid enforcement of the game laws of the state.

The result has been that all poaching and trespassing, as well as shooting from the road—a fertile source of complaint in this country—as witness the provision *re* ownership of game inserted in the Trespasses Act of last session, as a means of coping with this evil,—has been put a stop to, and the game, in this case chiefly quail and prairie chicken, have greatly increased, with resultant beneficial effects in the shape of increased insect destruction. It may be possible that the institution of similar associations in this Colony would meet with equally gratifying results; the law provides that the fines inflicted for shooting without permission, or trespassing for that purpose, on private property, should be paid to the owner, and in the case of an association, such fines could be added to its funds, thus forming a working capital which would enable the members to protect their property at the minimum of expense. In this connection it is only fair to acknowledge that the existing Game Protection Associations, formed by sportsmen in Cape Town, Kimberley, Port Elizabeth, East London, and other parts of the Colony, have done much towards stimulating interest in the protection of game and the destruction of vermin, and their assistance generally in this direction is much appreciated by the Government.

The farmers of our Colony, as well as all lovers of Nature, are in a position to do a great deal towards promoting the better preservation of our varied and beautiful fauna, which have suffered so much with the onward march of civilization, and which, unless unremitting care is paid to them, will unfailingly disappear in course of time, as the eland and many others have already done in this Colony.

THE OSTRICH FEATHER INDUSTRY OF THE CAPE.

At the recent meeting of the Zwart Ruggens Farmers' Association, Mr. R. Penny (Ostrich Feather Expert of Port Elizabeth) delivered the following address on the above subject:—

It may be of interest to the members of the Zwart Ruggens Farmers' Association, if I, for a moment or so, draw their attention to the progress that the ostrich feather industry has made. To do so, I must bring to my aid some amount of figures which, I readily admit, are, at all times, dry reading, but in this instance I hope will be the means of proving to our friends here what wonderful strides this industry has made.

Practically the first shipments of any note were made during the year 1865, when 17,522 lbs. were shipped from the whole of the Colonial Ports. The value was £65,736, or in other words, an average price of £3 15s. 0d. per lb. weight.

Ten years later (1875) a census was taken, when the number of birds in the Colony was placed at 21,800 (domesticated). The total weight shipped that year was 49,569 lbs. of a value of £304,933, the average price having risen to £6 3s. 0d, this average price standing as a record—both up to that year and to-day.

Five years later (1880) the weight of feathers exported had increased to 163,065 lbs. the monetary value being £883,632, but the average price, owing to the huge increase in weight, viz. 114,000 lbs, had been reduced to £5 8s. 4d.

Now, taking 1882 as being the greatest year, from a monetary point of view, I find that the weight shipped was 253,954 lbs. the value being £1,093,989, truly a great increase in money value, but the average price had declined to £4 6s. 3d, as against £6. 3s. in 1875, and £5 8s. 4d. in 1880. Thus I find that, comparing the increase of weight of the year 1882 with that of 1875 the increase is 204,385 lbs, or in other words, an increase in weight of 102 tons $\frac{1}{4}$ cwt.

This great increase in weight had, however, resulted in a very serious decline in value, the decline being equal to 30 per cent.

This position, as far as the output of feathers, in regard to weight, is concerned, was maintained until 1888, but the average price has received a tremendous set back, having fallen to £1 6s. 8d. per lb, or in other words, a depreciation, as compared with 1882, of 69 per cent. This decline was felt by the whole of those interested in ostrich feather production, with the result that we find

a diminished quantity of feathers shipped. The year 1891 saw the lowest point reached for something like ten years. The amount shipped during that year was 198,046 lbs., of a value of £468,221, the average price standing at £2 7s. 4d., and it is interesting to note that 1881 produced 193,612 lbs. or, in other words, 2 tons 4 cwt. less than 1891, yet the average price per lb. stood at £4 12s. 6d. against £2 7s. 4d. for 1891, a depreciation of more than 49 per cent.

It is undoubtedly tiresome work wading through these figures, yet to any one who has the industry at heart, it is interesting to note the fact that, as the weight has increased so the average price per lb. has decreased. I must again refer to figures, after which I will turn to subjects more of interest to the gentlemen around me.

After the set back to the industry, experienced during 1888 when the lowest average price per lb., viz. £1 6s. 8d., had been reached we come down to later days. During 1904 the production was 470,380 lbs., of a money value of £1,058,355, the average price standing at £2 5s. yet a further increase in value is shewn at the close of the year 1905, during which year a grand total of £1,120,298 was shipped to the markets of London, the Continent and America. For the ten months of this year the amount shipped stands at £1,089,210, and as I put the amount to be shipped during the next two months at something like £220,000 we find that 1906 has topped all records, the grand total standing at something like £1,300,000—(applause)—truly a huge total and sufficient to make us reflect. (Hear hear).

Our last census gives the total number of birds in the Colony as 358,370, as against the number given in the 1891 census of 154,880, or in other words, an increase of 203,490 birds. What the present number would be it is difficult for me to give even an approximate guess, but we all know that the increase of young birds this season has been enormous, for I have never, in all the 30 years that I have been associated with the trade, seen such an enormous quantity of young birds' feathers coming to market, and it is in this connection that I think a few words from me will not be out of place.

FUTURE TRADE.

With this enormous increase in production it must follow that common, or low grade feathers will suffer, and in the event of fashion changing and turning to artificial flowers, or other ornaments, all common class feathers will become nothing more or less than a drug in the market, and I regret to say that I have seen very many hundred pounds weight of feathers coming to market of a most inferior description—practically rubbish. I am, however, very pleased indeed to state that this remark does not apply to the farmers of the Zwart Ruggens, for I have seen, and handled, some grand productions which reflect great credit on the producer and

have commanded the highest prices in open market (applause). Such productions will, at all times, realize to advantage, and the producer will always get a full return for his efforts.

THE STUD BOOK.

During the period that I have had the honour of being associated with this important work as examiner or expert, I have passed through my hands some most beautiful productions some almost faultless—and I am sorry that I am unable to give you the names of the owners, but as all the pluckings come down to me identified by numbers only, I do not know the names of the farmers. But, gentlemen, this movement is a most important one—a move in the right direction—for by its efforts we will be able to establish a perfect record of the best birds of the Colony, and the birds passing the examination will become standard birds and will, in the near future, be the means of building up a perfect class of feather producers. We must, at all cost, get away from the low grade bird, who costs as much to feed and takes up as much room as the well-bred bird, and who does not, and cannot repay in proportion the farmer for his efforts.

I now beg to place before you the class of feather most in demand by the manufacturing firms of Great Britain, the Continent and America. Gentlemen, the great cry is—"Give us good stuff." "We don't want rubbish." This, gentlemen, will furnish you with the reason why your good pluckings invariably command the highest price, not only in the Colonial market, but in the markets of the world.

(A number of feathers were then handed round for inspection. Speaking of two especially fine bunches of primes and feminas, Mr. Penny said that in density they were practically perfect. The quills were light, well-clothed, and well-flued to the bottom).

I now, Sir, will pass round, in order to shew what I consider the most desirable class of feather to produce—and now that these desirable descriptions have passed your hands, I beg to submit the class that I, without fear of contradiction, state will become, in the near future, a veritable drug in the market.

SLACKNESS OF FLUE.

This feather is, to all appearance—in the bunch a fine class of feather, but an examination of the individual feather shews at once a woolly, slack flue, the texture throughout being altogether too slack. Now, gentlemen, having spent some years in the manufacturing department, together with an experience of the dye house, I profess to know something about the weight of the various dyes used. For instance, if the manufacturers have orders for light colours it is possible that a feather of this class will carry the dye,

of say a light cream, yellow or blue, but the more dark the colour becomes, so is the weight of dye increased. Thus to carry a dark brown, the texture of the feather must of necessity be a strong one; when it comes to dyeing black, the weight of colour is such as would tear this feather to pieces and it would come out of the dye bath nothing but a bunch of rags. Practically it would be a quill with nothing but a few strands of flue left. To put the thing in a nutshell, as the density of the dye increases, so must the strength of the feather be in proportion, or, in other words, only strong, well-built feathers can be used for dark colours. You will naturally exclaim "What has that got to do with me?" My reply is "Everything," for the simple reason that buyers are very discriminating and, if orders are placed for a certain class of feather, that class of feather will command a high price, whereas other grades will be neglected and sold at a price which will be unremunerative to the grower. (Here a feather was shewn in condition for curling).

BARS.

I do not know whether I am allowed to touch on this subject, but as I have some interesting exhibits here I ask for your kind indulgence whilst I pass them round. I have also a microscope and slides, shewing bars of all descriptions, also perfect, well-bred and developed flue, which may be of interest to the gentlemen around me.

THE CAUSE OF THE BAR.

It is, indeed, difficult for one who is not a farmer and in direct touch with birds from day to day to state distinctly, and with authority, what is the cause of the bar. Certain it is that this defect does not appear to any extent in the feathers of the wild bird. (Samples of wild feathers were here passed round).

I am convinced that every farmer has his own opinion and theory on this subject. Some put it down to the result of the ostrich fly. Others say it must be the result of a pest or mite, but I still maintain that the source of the trouble is in the blood of the bird, or, in other words, the result of too much in-breeding, and I further maintain that parent birds carrying heavy bars are likely to have the same defect more pronounced in their progeny. I cast out the idea that it is the result of insufficient feeding, for the simple reason that amongst the feathers of the most valuable birds—birds who shew, by their grand plumage and perfect lustre, that they have not suffered by lack of food or attention—I find bars of the most pronounced description.

While not able to state, with authority, what is the cause of the great set-back, yet I feel that I am perfectly safe when I state distinctly that the defect must be sought for in the blood of the

bird, and a more liberal interchange of birds would result in the eradication of this serious damage to industry.

To my mind the few feathers which I now pass to you put an effectual end to the idea of pest, as the feathers shew a bar which is quite new to the bulk of the producers. I also exhibit to you some feathers which have bars on one side of the feather only. The feathers I now hand to you are the feathers of a pure bred Minorca. From this stock I have in-bred for the past three seasons, with the result that I have produced bars which are identical with that produced in the ostrich. An examination of these feathers will, I am sure, bear me out in my theory that in-breeding is the cause of this defect.

EXPORTING BIRDS.

Now, gentlemen, I have to draw your serious attention to a matter which affects all those who have the future of this extraordinary industry at heart. You are all aware, I am sure, that a fair number of birds have been exported to America, and the Murray and Black Swan River districts of Australia. In California, and other districts of America they are doing their best to establish ostrich farming, and in one of the recent American publications I read full details of their efforts and of their appeal to the people of the United States to patronize American grown feathers. Now, Sir, America is one of our best customers, and without their aid and purchasing power our values would fall to an alarming degree. I have also read of efforts being made to establish ostrich farming in India, and I may mention that in Southern Europe, on the shores of the Mediterranean an ostrich farm exists. Now, it is an established fact that our Government has placed an export duty of £100 on each bird leaving the Colony—but what is a £100 fine to men who wish to get fresh blood? I can assure you that our American friends will, in the near future, readily pay this amount to get good birds and, what is of the most vital importance to them, fresh blood to assist them in building up their flocks. Most of you, I am sure, read only recently that 1,000 birds were to be exported. How this rumour came about I am unable to say, but a representative of one of our leading steamship lines came to me soon after this got into print, and asked me if I could give him any particulars about it. Being a bit of a Scotchman, I asked why. He told me that they would fit out a steamer and give cheap freight. I told him that if I could prevent it, he would not get a bird out of this Colony. (Applause).

Gentlemen, this is a danger to be met by you persuading our Government to absolutely prohibit the export of birds—not only from the Coast Ports, but from passing the borders of the Colony—for so sure as our American friends get possession of any number of good birds, you may say “Good-bye” to one of our best

customers, and will find that the remarkable monopoly which you possess to-day is destroyed, and prices will come down to such a level as will leave you sorry men. (Applause).

In conclusion, gentlemen, I will condense the remarks contained in this paper "Grow good feathers, get rid of your common grade birds, give strong support to the Stud Book and so build up a fine class of feather producers and persuade our Government to pass a most stringent Act totally prohibiting the export of birds." (Loud applause).

MICROSCOPIC SLIDES.

The following microscopic slides were exhibited during the lecture :

- No. 1. Well formed dense flue.
- „ 2. Moderate flue, showing beginning of bar. (Close to stem).
- „ 3. Well developed flue, equal density.
- „ 4. Bar in flue very pronounced, stem partly destroyed.
- „ 7. Perfect Black, very dense and of fine quality.
- „ 8. Black, very poor quality, Bar very pronounced.

Minorca Feather (large one) showing Bars.

THE CULTIVATION OF PASPALUM GRASS.

Mr. B. Harrison, of Burringbar, Tweed River, N.S. Wales, Australia, forwards for publication the following communication which he addressed to the *Tweed Times* and was published by that journal. The subject is of such far reaching importance to the farmers of this Colony that we reproduce it in full.

TO THE EDITOR OF THE "TWEED TIMES."

Sir,—Would you kindly permit me to give your readers some information on this highly important subject, as I feel certain it will prove of great benefit, and interesting to many of them. All stockowners are aware of the great value of good fodder plants, and after many years' experience and observation of this marvellous grass, which appears to thrive well and yield abundantly in all soils and situations, I do not think I can make a mistake in saying, that to your graziers and dairy-farmers it would prove one of the greatest boons with which they could possibly become acquainted. After about 12 years' experience, *Paspalum Dilatatum* has become the favourite grass with the farmers on the North Coast of New South Wales, Australia, and to the dairymen especially it has proved a veritable mine of wealth; and can be converted, if necessary, into hay, ensilage, or chaff.

It produces an immense amount of succulent herbage, which is eagerly relished by all stock; grows from 5ft. to 10ft. high; bears a large quantity of seed, which can readily be disposed of at a good price; and thrives well almost anywhere. No other grass can equal it for rapid growth, quantity and quality of herbage, and its adaptability to almost any soil or climate; and the person who introduces this grass into his district will prove a benefactor not only to the locality in which he resides, but the country generally. Any land on which *paspalum* is established is worth from £10 to £20 per acre.

Once established, this grass remains permanent for all time, and saves the farmer from the great annual expense entailed in the purchase and cultivation of other grass seeds. In the Tweed district (New South Wales) the seed is sown after the scrub or other growth has been felled and fired, at the rate of about 10lbs. to 15lbs. of seed per acre. Where there is much moisture the grass will, within a few months, be several feet high, and laden

with seed. In the dry districts the seed should be sown in Autumn, when the weather is cooler, and when there is a probability of getting rain.

This grass has proved very effectual in preventing and subduing noxious growth of all kinds, and to those landowners who are troubled with the persistent and expensive growth of ferns or thistles, etc., it would prove a great blessing; but it should not be sown on land intended for the cultivation of other crops, as it is a very prolific seeder, and when once established is very difficult if not impossible to eradicate. There are good paddocks of this grass on the Tweed that have been in existence for the past ten or twelve years. It has been known to yield, at the Wallongbar Experimental Farm, on cultivated ground, when four months old, 22 tons of green fodder, and several successive cuttings of over 13 tons each per acre, within the year. On fairly rich soil where there is a good rainfall this grass should easily sustain one bullock, or ten sheep per acre, and from 50 to 100 pigs could be kept in good condition on a few acres with the addition of some skim milk or other feed. All persons who have used it for this purpose speak very highly of it.

It is almost impossible to calculate the extent to which it has enhanced the value of all property, and a large area of land which a few years ago was considered absolutely worthless, has, through its cultivation, become of great value, and is now producing large profits, and it has given a great stimulus to settlement and enterprise. It has done more for the prosperity of the North Coast than any other variety of fodder could possibly have done, and it has also been the principal factor in making our dairy industry—which has now assumed immense proportions—highly profitable, and the lands on the North Coast famous throughout the world. Land which a few years back could have been purchased for a few pounds per acre, is now worth from 50 dols (£10) to 125 dols (£25) per acre, and the reserve price in some instances has been fixed at 150 dols (£30) per acre. This famous plant resists the evil effects of frost, drought, or flood more effectually than the other varieties, and will preserve its verdure when all other grasses would be scorched or dried up with the summer heat and the frosts of winter. To prove the truth of these statements I shall quote from a few of our leading authorities:—

Of this celebrated grass, W. S. Campell, Esq., Director of Agriculture, New South Wales., says: "This grass has attained such remarkable prominence, and so many persons have become acquainted with its great value, and so much has been written about its merits, that anything one can write upon the subject seems to be superfluous." He also says, speaking of its introduction: "Gradually the farmers took to planting it, and as its excellent qualities became known the demand for seed and plants became enormous, and its name has now become familiar to every

man, woman, and child, not only in the Richmond and Tweed River districts, but all over the coastal districts of the State."

The same gentleman, who recently visited these districts, said to a Sydney reporter, "That he, like others who had been here, had returned greatly impressed with the prosperity of the people. The *paspalum* grass in many places was five to six feet high, and it was difficult to see the cattle in it. Indeed, if the grass stood up straight it would be impossible to see them. As it was only their backs were visible, and he believed that it would support five or six head of stock per acre for several months. Land was realising large prices, and he thought it would go still higher."

Mr. Varley, editor of the *Clarence and Richmond Examiner*, says of this grass: "It is a wonderful fodder plant. Given a sufficiency of moisture, it will flourish in all classes of soil. I have seen it luxuriating in swamps, with water over its crown; in the Big Scrub in its glory; on the sandy barren wastes of the seashore; but nowhere have I seen it grow with greater luxuriance than on the forest ridges. A few years ago the Richmond was threatened by a weed called the Mullumbinby Couch. Cattle fell away on it, and many died. Since the introduction of *paspalum* this weed has had notice to quit. As in quality, so in growth, as compared with other grasses,—it is *paspalum* first, the rest nowhere. An energetic man, backed up by *paspalum dilatatum* and cows, is almost sure of success. Take the 'Big Scrub' of the Richmond as a case in point. Fifteen years ago this magnificent tract of country was practically in its primeval state. It was equally provided then, as now, with steam communication to Sydney. No point of it was more remote than 15 miles from water carriage. Yet no progress was visible. Five years later the railway from Lisimore to the Tweed was opened. From that day the jungle began to disappear, and to-day the whole face of the country is altered, *paspalum dilatatum* being substituted for scrub, and dairy cows for paddymelons. One butter factory alone which opened with the advent of the railway, has increased its output from one ton a month to 350 tons a month. A herd of cows will easily average £10 per head per annum. One farmer (resident in the Coramba district) published his receipts for one year which shewed a credit balance of £600. His area was only 160 acres."

This is what Mr. C. F. Julius, Secretary, Dairy-men's Union, Bucca Creek, says in the *Government Agricultural Gazette*, New South Wales: "This remarkable plant is quickly coming to the forefront as a grass peculiarly adapted to our uncertain climate. Being a deep-rooter, its properties as a drought resister alone proclaim it invaluable; and while throughout the warmer seasons of the year it surpasses all other grasses in the rapidity and abundance of its growth, the severest of our frosts, although retarding its growth, fails to subdue its evergreen state. It is

most efficacious in subduing and preventing the growth of all noxious weeds. By the assistance of *paspalum dilatatum* many lands hitherto deemed worthless in their rocky, hilly or swampy situations have been triumphantly reclaimed."

The *Agricultural Government Gazette* says: "Throughout the length and breadth of the Northern dairy districts *paspalum* grass is regarded as the king of pasture grasses, and at present it has, no doubt, every claim to such a position."

Mr. H. Munsey, of Dundas (New South Wales) says: "*Paspalum* is the grass that has revolutionised the dairying industry on the North Coast. Scores of instances can be quoted shewing that the capacity of farms has been doubled and trebled, and it forms a dense mass of succulent forage. Having spent over a month going through farms where this grass has been sown, I can safely recommend its planting on a large scale. I have seen farms where 100 head of dairy cattle have been kept all the year round on less than 100 acres of land, giving splendid returns in milk and butter. This grass if enclosed for a short period during Autumn will provide a good supply of feed for the Winter. Its value to the State cannot be expressed in thousands of pounds."

Mr. Brandon, the well-known manager of the North Coast Co-operative Butter Factory, says of *paspalum*: "I do not know what this district would have done without it, especially during the very dry weather we experienced some time back. With regard to the quality of the butter manufactured from it, it is all that could be desired."

This factory, which was established about 10 years ago, and is owned and controlled by our farmers, for the month of January last, paid away to its suppliers for cream and pork, the immense sum of £44,500, "or at the rate of half-a-million" per annum. Nearly all the cows from which the milk is obtained for this factory are grazed on *paspalum*, and very few of them are either handfed or housed during the winter months.

Mr. Jas. King, President of Tweed River Dairymen's Union, says: "That to write of the merits of *paspalum* would require a newspaper."

In conclusion, Mr. Editor, and apologising for trespassing at such great length on your space, I trust this information may prove of much value to your readers, and will enable them to share in a portion, at least, of the prosperity which we on the North Coast of New South Wales have experienced for some years past, and if any of your readers require any information upon this subject they should forward postage for reply to,

Yours truly,

B. HARRISON,

Burringbar, Tweed River,
New South Wales, Australia.

[Beyond a doubt Mr. Harrison, who has been a resident of the Tweed for many years, is rendering farmers and graziers throughout the world a great service in so widely making known the virtues of *paspalum dilatatum*. In this work he has secured the patronage of the Governor-General, Lord Northcote, and we have no doubt that our American and Indian cousins, when they recognise the value of the grass as a natural fodder, will appreciate it as much as do the thrifty farmers of Australia. We note that the *Brisbane Courier* alludes to it as the "king of grasses"—which means that Queenslanders are profiting by the lesson taught them in its use by the farmers of New South Wales.—Editor, *Tweed Times*.]

BARS IN OSTRICH FEATHERS.

Address by Professor Duerden.

At the recent meeting of the Zwart Ruggens Farmers' Association (Hon. R. F. Hurdall, M.L.C., in the chair), an interesting address on bars in ostrich feathers was delivered by Professor Duerden (Professor of Zoology at Rhodes University College, Grahamstown). He described his researches as a combination of practical and scientific effort and briefly reviewed his labours of the past fifteen months. Ultimately, he got three chicks of his own. The Government was helping in this matter of investigation, and was prepared to pay, but he (Mr. Duerden) had realised, as many of his hearers doubtless realised, that the further they got into the matter the more difficult it became. Dr. Hutcheon (Director of Agriculture) had been visiting Grahamstown during the previous week, and had given him (the lecturer) to understand that he was keenly interested in the matter, and that the work should go on, as it would be encouraged from year to year, and the expenses of the investigation would be met.

The Upper Albany Farmers' Association had appointed some of the best known men around Grahamstown to act upon the special Committee which met once a month, and it had been suggested that they might have corresponding members from the different Associations—(hear, hear)—so that if the Zwart Ruggens Farmers' Association cared to appoint one or two corresponding members, he would take it as a compliment. He had also been in communication with ostrich farmers in all parts of the world. He had been in communication with people engaged in ostrich farming in Florida and California, for instance—in the latter State

with a man who had a thousand birds and who carried on the thing on a very elaborate scale. He advertised his "show" in the papers and charged visitors so much a head! The Professor added that he was also corresponding with the Agricultural College of New Zealand, where there were from two to three thousand birds, and also with the authorities in Australia, and in parts of Northern Africa. The idea was that South Africans should know exactly what was being done in other places and countries.

The lecturer then devoted ten or fifteen minutes to an exposition of the huge diagrams on the board behind him, shewing the growth and structure of the feather,—how it is the epidermis or outer skin which gives us all feathers, hair, nails, enamel of teeth, and hoofs of horses. Bars were not a phenomena confined to feathers: they had been found in all of the above-mentioned structures.

The replies to the Secretary's query (as to the cause of bars) were numerous and extremely diverse. Several had stated that they had got "a sure cure," whilst others had written to the Government offering to reveal a certain preventive for a substantial payment. (Laughter). But the one difference between a mere explanation put on paper and an explanation which would satisfy men of science was that in the latter case you would have to be able to prove it.

THE PARASITE THEORY.

First they might consider (continued the lecturer) the theory that bars were due to insect parasites or pests. This view was prevalent around Grahamstown, but it did not seem to be so very prevalent in the district of Graaff-Reinet.

Professor Duerden exhibited at this stage a number of interesting photographs and, continuing, said he had put the chicks to which he made reference under close observation: they had been placed on ground on which ostriches had never been before. The birds had never seen a mite or a fly, and there was not the slightest evidence of tapeworms, and yet all the chicks had barred feathers. This proved that bars were independent of external parasites, and one of the factors was therefore eliminated.

THE "NUTRITION" THEORY.

Then came the next explanation, viz., that there had been some interference with the nutrition of the feather—which seemed a much more reasonable explanation. A great number of arguments had been advanced in support of this view, and he (the lecturer) had an extremely good instance of it at the meeting. (A feather showing a gap in the plumage was here exhibited). One of the chicks was taken (as an experiment) from lucerne to the veld for a period of three weeks: the veld in question was not very bad.

As the feathers continued to grow, this was the result. There was not the slightest doubt that the space corresponded with the formation of the feather while the chick was on the veld. They had therefore undisputed evidence that the nutrition of the bird has a good deal to do with the subject, but—and he wished to emphasize this—nutrition was not everything: what had been proved was that the ostrich was a highly sensitive bird as regards nutrition.

Making further reference to his experiments, the lecturer said he was feeding the birds well in order to keep them in the pink of condition. His object was to see whether he could eliminate the bar. He did not say it would be conclusive but it would be suggestive.

FEEDING AND BREEDING.

With regard to the improvement of animals generally, the matter resolved itself into two methods—feeding and breeding—and as regards ostriches his great idea was to endeavour by means of the above to produce a barless feather. He maintained that given time, it was quite possible to bring about a barless feather.

Referring to quills. Professor Duerden said that bars were formed independently of the quill, but he certainly would not say that quills had no influence whatsoever. There was something fundamental about the formation of bars independent of these separate tendencies. He looked upon mal-nutrition and this peculiarity of the quill as predisposing causes.

Bars were found, he might add, not only in ostriches but practically, in all birds: they were not so marked, perhaps, but they were there. From experiments, he found that poultry in poor condition showed bars—on the tail feathers especially. He mentioned pigeons as a case in point, and with regard to bigger birds, they had at Grahamstown Museum, a rhea, a South American ostrich, and practically everyone of its feathers was barred throughout.

Bars could be produced artificially: pigeons well fed and starved alternately eventually showed signs of bars.

The Professor added that he was still carrying on experiments with different birds: the special advantage of small birds like pigeons was that, in the case of feathers, microscopic investigation could be made. At present he had not come to any conclusion as to how bars were produced: he could give them the conditions, but he could not explain *how* they were produced. They were due to some external constriction, but what caused that constriction he was not prepared to say. He was inclined to think that it was a shrinkage of the tissue due to mal-nutrition, but this he was not prepared to demonstrate. He hoped the next time he addressed his hearers to be able to shew them how this constriction took place and prevented the feather from fully extending. (Hear, hear.)

He had given them the position as it was to-day, and if they could help him in any way by writing or sending specimens he would only be too pleased to hear from them. He particularly wanted to be able to examine the wing of a very badly barred bird, when the feathers were about half-grown. If any of his farming friends came across anything of the kind, he would be much obliged if they would send it to him.

WANTED: FIXITY OF TYPE.

With regard to some remarks which had fallen from Mr. Walter Rubidge, he (the lecturer) quite agreed with him. It did seem very important that South Africans should get certain types fixed—as regard birds as well as merinos and other stock—so that they could always depend upon the birds breeding true to type. Then, given certain types, they could in breed and get different varieties from them.

In the matter of diseases, and referring to the ostrich tape-worm, the lecturer said that the ostrich eggs must be eaten, and then the ostrich must eat a substance containing the eggs; in order to produce a tape-worm, it must pass through twice.

At this stage a letter was read from Mr. Sam Probart, of Poortje, in which he said that he for one had always been very anxious to find out the real cause of bars—such a serious damage to the feather. One year in particular, his clip was damaged to such an extent that instead of £500 he got only £250, but the following year, from the very same birds, he got a very good clip. The natural conclusion he came to was that it was a natural defect, perhaps caused through excessive heat or cold weather when quilling. (A feather was forwarded in support of this contention, the bars being visible right to the bottom of the quill). He did not for one moment think that an insect was the cause, or bad treatment. He did not mean to say that clipping more than once a year would not damage the quality of the feather: most assuredly it would.

Mr. C. G. Lee: Do you think the ostrich more sensitive to sudden changes than any other bird?

Professor Duerden: From many instances it does seem as if the ostrich is highly sensitive. I can mention a number of instances where the birds on being moved from one veld to another responded readily. Even where the second kind of veld was the better, the birds have shewn more bars.

In further reply to Mr. Lee, the Professor stated that the ostrich was specialised in the production of feathers, and to form such large feathers was a very serious drain upon the constitution of the bird. Hence any interference with the condition of the bird was very likely to interfere with the production of feathers. He thought the ostrich would shew this much more readily than

any other bird because it produced much more, or rather larger, feathers.

In the course of a friendly discussion the Professor said he would like to go through the numerous letters that had been received from interested farmers, and make a précis which he could submit at the next meeting. (Hear, hear).

On the motion of Mr. C. G. Lee, the following resolution was unanimously adopted:—"That this Association very highly appreciates the presence of Professor Duerden, and for the valuable information supplied, (information collected in a manner thoroughly practical as well as theoretical) desires to convey to Professor Duerden its most hearty thanks, and further conveys to the Rhodes University College thanks for the material supplied by the Professor which is useful, interesting, and instructive. Further that this Association realises that Professor Duerden's researches are of the very greatest value to this country, and trusts that further and more substantial help will be granted for further and more elaborate investigations."

It was decided, on the motion of Mr. Lee that a sub-committee of three farming members be elected by the Association Executive to keep in touch with Professor Duerden in the matter.

CAPE PRODUCE IN LONDON.

The Commercial Aspect.

Reports on Canned Guavas, Dried Fruits, Honey, and Almonds.

The Agent-General has forwarded the following reports procured by the Commercial Agent in London (Mr. Lewis Atkinson) :—

CAPE CANNED GUAVAS.

We have examined the tin of Cape Guavas which has been packed by Messrs. J. J. Hill & Co., and as far as the packing and the quality of the fruit and the treatment generally, our report must be exceedingly good ; in fact, we came to the conclusion that there is no doubt that Messrs. Hill understand the packing of the fruit. We are afraid, however, that Guavas in this form will never be popular here, and we do not think that even a low price will mean a large sale. The flavour is an acquired one, and is, in our opinion, more suited for tropical countries. The seeds would also be an objection, and with the seeds removed, the fruit would be nothing more than a jam. We may say that we have been endeavouring to introduce Cape Guava Jelly in a most presentable form at an exceedingly cheap rate to the British public for some time past, but with very little success, and we have come to the conclusion that the flavour is not acceptable among the middle classes.

(Signed) J. TRAVERS & SONS, LTD.,

119, Cannon Street, London, E.C.

July, 23, 1906.

DRIED FRUIT.

We have pleasure in giving our views on the different varieties of fruit which have been inspected by our representatives at different times.

Sun-dried Apricots are equal to some of the very finest fruit which is shipped to this market, and should at all times command

a good price, varying, we may say, according to the supply here, but as a rule, from 70/- to 80/- per cwt., duty paid in London.

Evaporated Peaches are very good in colour, but not so large as some fruit which is shipped here. The demand for this fruit is at all times very poor, and the quantity sold here is very small; but the price it would fetch as a rule would be in the neighbourhood of 40/-.

Raisins are excellent in quality, colour and texture, and if they can be sold in London in the neighbourhood of 40s. per cwt., there will be a very good demand for them. Some improvement of the system of packing, however, is necessary before they would be readily adopted in the London Trade; they would have to be graded as to size, packed in smaller boxes, say 14 and 28 lbs. net each, and faced in a somewhat similar manner in which the dried plums have been treated.

Sultana Raisins are a very good useful fruit for this market, the quality and substance are fine, but the colour is much too dark to command a high price on this market. They would, however, almost at any time command a price from 35/- to 40/- per cwt., duty paid in London.

Currants are only medium quality fruit, the berries are not sufficiently filled, the flavour is not similar to the flavour of the Ionian Fruit; the colour is not much better than the lowest grade which is shipped from the islands, and unless greatly improved, not suitable for this market.

Walnuts are very good, but owing to the system of drying in the sun, we are afraid the kernels have deteriorated. The usual value of these goods is about 25s. per cwt. but the quantity sold here is very small.

Almonds. The shells of these are very hard and they would be almost unmarketable here; prices which are usually ruling for these goods here vary from about 25s. to 40s. per cwt., according to quality.

Plums. The dry Plums which you send us are very good indeed in quality, the flavour and appearance being similar to the Californian fruit, a large quantity of which is sold here every year. The system of curing is, however, not yet perfect, as we notice one of the boxes is showing mildew. This is due, we think, to too much moisture having been put into the fruit after it was sundried. It may, however, be due to the box having been made damp during the voyage and transit. The Plums also require to be graded in seven sizes, and the number of plums to the lb. stated on the packages, which should be about 28lbs. net each and the shape of the Californian box at present used.

We have pleasure in making you the following offers for the portion of goods which you have in London :—

Apricots ...	...	85s.	per cwt.,	duty paid	London.
Peaches ...	...	50s.	"	"	"
Raisins ...	...	40s.	"	"	"
Sultanas ...	...	40s.	"	"	"
Currants ...	...	25s.	"	"	"
Walnuts ...	...	30s.	"	"	"
Shell Almonds	...	30s.	"	"	"
Plums ...	...	28s.	"	"	"

(Sgd.) J. TRAVERS & SONS, Limited.

July 21st, 1906.

DRIED FRUIT AND HONEY AT THE CRYSTAL PALACE EXHIBITION.

We have pleasure in reporting on the samples of fruit shown to us at the Crystal Palace Exhibition. We may say that generally speaking, we consider the fruit of exceedingly good quality and with certain alterations, in the majority of cases, would be highly suitable for this market.

Plums.—The quality of the Plums or Prunes, as you call them, is exceedingly good, and of the Oregon type of fruit. The method of processing and grading is much behind the Californian and French methods, and it is evident that in this direction your processors require instruction. We would suggest that you adopt the title of "Cape Imperial Plums" and that under this you put the packer's name. In this case we saw the Donkerhoek Fruit Syndicate Packing. The keeping quality of the fruit depends entirely on the methods of processing, and the Californians are now able to guarantee that their fruit will keep black for more than six months. There is no difficulty in obtaining this result when the correct methods are known. We also saw a mark of plums "R.F.F." not quite the same variety, and not so suitable for this market. The processing in this case was also incomplete. The shape of the box was not suitable, and the weight should not exceed 25lbs. The fruit had the appearance of having been packed without being drained after being processed with the result that it had turned white and sugary. The grading was also imperfect, and it ought to be borne in mind that the fruit is quoted on this market in sizes varying from 5 to 10 plums, generally commencing with 30 to the lb. and going up to 120. We would suggest that this packer should adopt same shaped boxes as the Donkerhoek Fruit Syndicate.

Almonds.—The soft shelled almonds were of excellent quality, and will at any time fetch the highest prices, provided this regularity is maintained. The hard shells were also exceedingly good, and we have no suggestions to make for their improvement.

Sultanas.—The sultanas packed by J. P. Hamman, of Worcester, are excellent, both in flavour and quality, but twiggy in appearance; and if this could be reduced and the Greek process adopted, the fruit would fetch quite 10s. per cwt. more. We shall have pleasure in sending you in a short time samples of the new Greek variety.

The colour of Messrs. Hamman's fruit is a little dark and the condition too moist.

Currants.—The flavour of the Cape currants is not the same as the Greek variety, and, considering the difficulty that the Greeks have had in dealing with the quantity of fruit they can produce, we would suggest that the production of currants will never satisfactorily pay the farmer if intended for exportation.

White currants are not suitable for the English market, and, consequently, would return a very low price.

Peaches.—The quality and condition is excellent, the weight of the fruit is above the average, the packing is good; and if the boxes were reduced in size, say to 25 lbs. each, and well faced, the fruit should fetch good prices.

Apricots.—Boxes in this case are too large, the 25 lbs. size should be adopted, the fruit nicely faced, and overlaid with lace paper. The quality and condition of the fruit leaves nothing to be desired. Perhaps a little later it would be found that the fruit would travel without being so highly dried, in which case extra moisture would of course result, as a benefit to the farmer.

Hamman's Stalk Raisins.—The quality and flavour of this fruit is exceedingly good, but the condition in which it is packed is unsuitable for the trade in this market. The raisins should be quite free from stalk, packed in 14 lb. boxes, and the large fruit shaken to the top and pressed, and overlaid with a little lace-paper. It must not be forgotten that it is only in exceptional years when a paying price can be obtained for this fruit. During the whole of last season Spanish raisins were sold on this market at £9 per ton, landed in warehouse in London, but not duty paid. In the present season the price will probably reach an average of £40 per ton, because the crop is reported to be about 15,000 tons as compared with 28,000 of the previous year.

Having these facts in mind, it will be for the grower to decide whether the risk of production for this market is worth taking.

Honey.—We have examined the samples of honey, which we consider to be very good, both as regards texture and flavour; but we do not think it up to the standard of English honey, and would, therefore, have to be sold at a lower price. The honey consumed (especially for domestic purposes) in this country consists of practically two kinds, viz., English honey and foreign. The English realises about 6d. to 8d. per lb. for strained and about 8d. to 10d.

per lb. for sections. The finest foreign honey that we import, is from Jamaica, and it is against this honey (which is obtained in almost unlimited quantities) that your product will come into competition.

We may mention that the usual packages for Jamaica honey are casks of about 3 cwt. each, and cases containing two 56 lb. tins. We do not think it would be advisable to exceed 3 cwt. in any one package.

The following represent market values, assuming the package to be the same as Jamaica, viz., 3 cwt. barrels:—

SAMPLE

No. 1.—Bright liquid, good texture and flavour; value, 28s. cwt.

No. 2.—Liquid rather dull, good texture, flavour a little too strong; 25s. cwt.

No. 3.—Pale yellow set, good aroma and texture, but flavour slightly strong; 24s. cwt.

Honey in section is of very good flavour and quality, and is worth 5s. to 6s. per dozen sections.

(Sgd.) J. TRAVERS & SONS (Limited).

Sept. 13, 1906.

OTHER REPORTS.

You asked us this morning to give you an opinion upon some samples of Cape Raisins and Almonds, which you shewed us at Messrs. S. Hanson & Sons. It is a long while since we have seen any Cape Raisins in this market, but from what we saw of your samples, we should say that the quality is very much improved of late years, the size and colour being very superior; in consequence of the short supply of Spanish Raisins, if you had any in stock here at the present time, they would realise very good prices. We should never advise you to ship them on the stalk, as our grocers here have a great objection to the trouble of picking them. The Seedless, or Sultanas, are also of excellent quality.

With regard to the Almonds, as the shells are so hard we could never advise you to ship them in that condition. They should be carefully cracked, selected, and the best packed in boxes, and the broken and inferior in bags. By this means you save the freight on the shell, which is roughly half the weight.

Almonds are also very dear this year, and if consigned would meet a very good market.

(Signed) CLARK AUSTED & Co.,

Eastcheap, London, E.C.

Sept. 11, 1906.

Confirming our verbal promise to write you respecting samples of fruit submitted yesterday, we are pleased to say the quality of all the Raisins is excellent. The Currants are also very good.

These latter are of less moment than the Raisins, as Greece already grows more Currants than the world can consume, and is at her wit's end for expedients for their disposal.

Boxes of about 28 lbs. would be preferable to those of 50 lbs.

As you have a few packages here, we shall be pleased (subject to same being sound and in good order), as a practical way of shewing our idea of their value, to offer you for prompt reply and delivery for Stalk Raisins 38/-, Loose Raisins 42/-, Currants 24/-, Sultanas 45/- per cwt.; one month less 1 per cent.

If this ever comes to genuine heavy business, the rules of the trade demand that purchases be made through a recognised broker.

(Signed) SAMUEL HANSON & SONS,

Eastcheap, London, E.C.

Sept. 13, 1906.

We have much pleasure in submitting you the result of the report of the samples of honey which you sent us. It may be some guide to you to state that the light amber-coloured Californian honey, to which the report herewith refers, ranges from 28/- to 32/- per cwt., packed in tins about 60 lbs. nett weight of honey.

(Signed) SAMUEL HANSON & SON.

REPORT ON THREE SAMPLES OF SOUTH AFRICAN HONEY.

A.1.—Flavour and consistency good, but too cloudy and deeper in colour than that which is generally preferred in this market. This might be sold for grocery purposes, but in my opinion it is not sufficiently clear and light to compare with the best Californian.

A.2.—Very similar to A.1. Consistency not so good, being slightly granulated.

A.3.—Excellent flavour, but appearance uninviting, being very much granulated, and only suitable for manufacturing purposes. No doubt, the dark colour of the honey is owing to the flowers and district from which it is collected, but the British public prefer a clear light honey, and if sample A.1. could be in any way made more transparent, its value would be considerably enhanced.

CAPE AGRICULTURE.

A Plea for Scientific Methods.

BY C. G. LEE.

Ten years ago an able French Director of Agriculture said, in referring to his country, "In this country of extreme competition . . . the agriculturist can thrive only if, in working the soil, he adopts scientific measures."

Before and since this notable utterance, great has been the advance and distribution of scientific agricultural knowledge in the leading agricultural countries of the world, which have realised the importance of, and reaped a great reward for teaching their farmers agriculture scientifically.

In the Cape, very little has been done; we are suffering in consequence, and what is more, unless we, as a country, mend our ways in this matter, our children will be elbowed off the land by the sons of those in other countries who have more fully discharged their responsibilities towards the rising generation in this respect.

All will admit that scientific methods are not acquired by instinct, but all farmers are not so ready to admit and insist that the State must bring these means of learning farming within the reach of at least every young farmer.

This Colony agrees to the principle of scientific training in opening Elsenburg and engaging one or two travelling scientists, but it rests with the farmers to have the principle extended. *One* Elsenburg, with its twenty odd students, and *one* Dr. Nobbs may serve to admit the principle, but are, of course, totally inadequate to meet the needs of the thousands of young farmers who are embarking on the farming business, by which undertaking they must stand or fall, to be for the lasting good of our land if they stand, but to the irreparable loss of the country if they fall.

THE TRUE SOUTH AFRICAN PATRIOT

has cause to tremble for the ultimate success of the vast majority of our young agricultural population, pitted, as they are, against imported products, grown by farmers much more fully equipped with all the latest scientific methods in raising and packing the products of their soil and stock—products brought to our stores cheaply and quickly by steamships, and which can be distributed

here by powerful Trust Companies, which to withstand would puzzle a Roosevelt and his able confederates. Against such competition our young farmers will stand but little chance; in fact, it has been proved, over and over again, in such a conflict that the comparatively uneducated must be hopelessly beaten right off the field, but, given a fair opportunity of obtaining the needed training, our young farmers will not be found one whit behind those of any country, but if our young men remain heavily handicapped, by reason of the want of scientific training, they and the country must suffer.

The question is a serious one. Certainly there are a comparative few who have nothing much to fear, but where will the vast majority stand, if sent out unassisted? It must be self-evident that agricultural instruction should be regularly given to both sexes, in at least some of our normal and primary schools, and it is equally evident that more than one Training College is needed, where those possessing an aptitude might be trained, and some of them used—in time—as lights to travel in the country and make known scientific methods throughout the land.

These measures are required now, to meet the sure demands of the future.

The immediate serious feature is; those who to-day need scientific knowledge and methods, are now too old to go to school, and to enable these to better keep abreast with the times, special arrangements could be made to bring the required instruction as near the door as is possible by employing

AGRICULTURAL PROFESSORS

to travel amongst the farmers according to a well-advertised pre-arranged plan, these to give lectures, accompanied by demonstrations on various subjects, taking into account the capabilities of the districts visited, and having with them the necessary appliances for giving the demonstration in addition; and at the same time, small plots of land in at least some parts of the district could be got for demonstrating purposes, where owners are agreeable to grant such plots. (The writer knows of some plots that would be granted free of cost).

Whether such lectures and demonstrations could, in the earlier and initiative stages, be carried on away from the railway line is doubtful, but certainly, railway facilities could be granted to *bona fide* young farmers, and young men employed on farms, under certain conditions; for instance, that they were prepared to prosecute at least a limited course of study. It would, in any case, be highly desirable that anybody receiving privileges—in railway concessions or in other ways—should not be allowed to drift back, if possible.

In a short letter upon so great a subject, of course, only meagre outlines can be treated, and then in a dogmatic tone, which

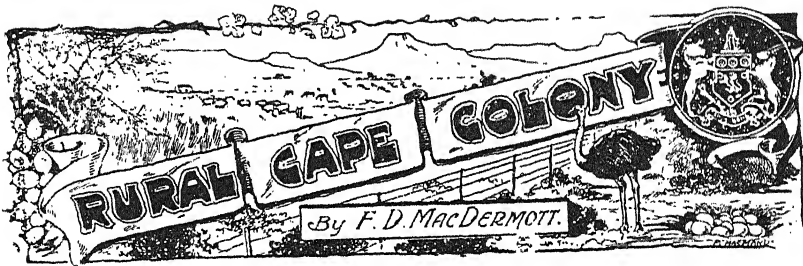
it is hoped my readers will forgive. Still it is held that a scheme arranging for a few travelling Professors, as roughly sketched, is well within the bounds of the practical; besides being within the means of the State exchequer, and would assuredly be highly appreciated by an ever-increasing number of young farmers.

Though Elsenburg and Dr. Nobbs are referred to, all realise that the Cape has very highly qualified scientists who work for the advance of agriculture in season and out of season, doing all that in their power lies, by investigations and researches and publishing all that is helpful. Nevertheless, the country must have those who can devote more time to giving instructions and demonstrations.

HOPEFUL SIGNS.

There are very hopeful signs of agricultural progress, from which encouragement can be derived, but any who take the trouble to carefully analyse the progress made in countries with which we, at our Home and at the world's markets, have to compete, is confronted by the unpleasant fact that the Cape is not making equal advancement. More particularly, I refer to the training advantages given to our young farmers, as well as to the coming ones still at school.

The present seems to be an opportune time to discuss this subject, seeing that early next year the various farmers' organisations meet in Congress, and the branch Associations, Unions, Clubs, etc., could consider the matter beforehand. The Zwart Ruggens Farmers' Association has had some experience in veterinary surgeons' lectures and demonstrations, which were well attended, not only by young but older farmers, and requests have been made for their continuance, and to add these to other branches of science. The Komgha Farmers' Association has also moved for the spread of more light on the working of the paramount industry, agriculture. This happens to come to the mind of the writer at the moment, but there are many others, inclusive of the South African press, who all have urged the spread of more scientific methods of farming. The thinking farmers all agree that the time has arrived for greater efforts. Therefore let us be up and doing in the work of advancing scientific methods in agriculture.



NO. XXII.

THE DISTRICT OF ALEXANDRIA.

There are many Districts in the Cape Colony capable of great developments of which very little is known outside the immediate vicinity, and though the case of most of these is regrettable, and some even deplorable, there are few that compare, for real hard-luck, with the district of Alexandria.

A glance at any large scale map of the Colony will shew that this district is most favourably situated for development purposes yet it has been allowed to stand still and stagnate while the neighbouring ports have been flooding the country with products which might easily have been raised alongside them. Alexandria lies on the shores of Algoa Bay within sight of that large commercial centre and seaport—Port Elizabeth. From the sea it stretches back towards the district of Albany on the north, with gradual undulations until it impinges on the foothills of the Zuurberg. Here it touches the district of Uitenhage which encloses it on the west, while on the easterly side its boundary is the district of Bathurst. As a consequence the section thus included shares many of the physical and topographical features of each of the districts mentioned, varied by others which give it a unique character of its own. It thus lies roughly on the direct route between Grahamstown and Port Elizabeth yet it is not too much to say that it is—comparatively speaking—one of the most backward districts we have.

Like all the other districts in the South Eastern Coastal belt of this Colony Alexandria has had much to contend against. But its greatest troubles in reality have been those that in time should prove its most valuable assets. Paradoxical though it may seem one of these has been its highly favourable situation. In the days that are now happily past the farmers in these regions found that

it paid far better to turn their attention to transport riding than to work on their farms. And they naturally followed the line of least resistance. The carrying trade to the Interior kept them busy for many years and when that was gone so many of them sat down on their farms looking for a return of the fat years, that they seemed to be neglecting rich chances lying at their feet. The chances were there right enough, and they are there still; but the conditions that would have made for their successful development were and still are absent.

Before this phase of the position can be discussed it is necessary to look at another point. As has been stated, the general countour of the district shews it to rise towards the higher levels of the back-country by gentle undulations. There are very few rivers or streams in the district, and if there were they could not provide water carriage for any distance. The soil formation is largely a light, sandy loam which, though excellent for agricultural purposes, is scarcely calculated to lend itself to the making of good roads. On these sandy loams the indigenous bush has made its home, until large tracts are covered with forests, and the leafage of these has added considerably to the wealth of the soil, but has done nothing towards providing material for the making of good roads. The result is that for all time the problem of Alexandria cannot be the question of production, but that of transport.

We are thus faced with the anomaly of a district rich beyond the dreams of avarice with agricultural possibilities, situated close to some of the larger consuming centres, and within easy reach of one of the largest and most important seaports in the Colony, languishing for years in a condition bordering on abject poverty all for the want of adequate means of transport. With a population that, for the most part, was unacquainted with the necessity for advanced methods, and the majority of whom are not burdened with wealth it was more than difficult to induce them to launch out into an expensive system of main roads. The cost of constructing roads in such a country is not to be measured by the charges for labour alone, as it is in other parts. To do this kind of work thoroughly, it is necessary to have good material within reasonable reach, and this the district of Alexandria lacks. It is not to be argued from this that attempts have not been made in this direction, but the difficulties have been so great that even the more progressive and active members of the community have become disheartened from time to time and the problem of transport to-day is as acute as it possibly could be.

Alexandria offers very few difficulties to the cultivator. The soils are easily worked and give splendid returns. The only trouble is to get the stuff to market when the harvests come in. Such a state of things could be understood of a district distant from a main line of railway, where the question of cost would give grave cause for hesitation, but that a section of the Colony so

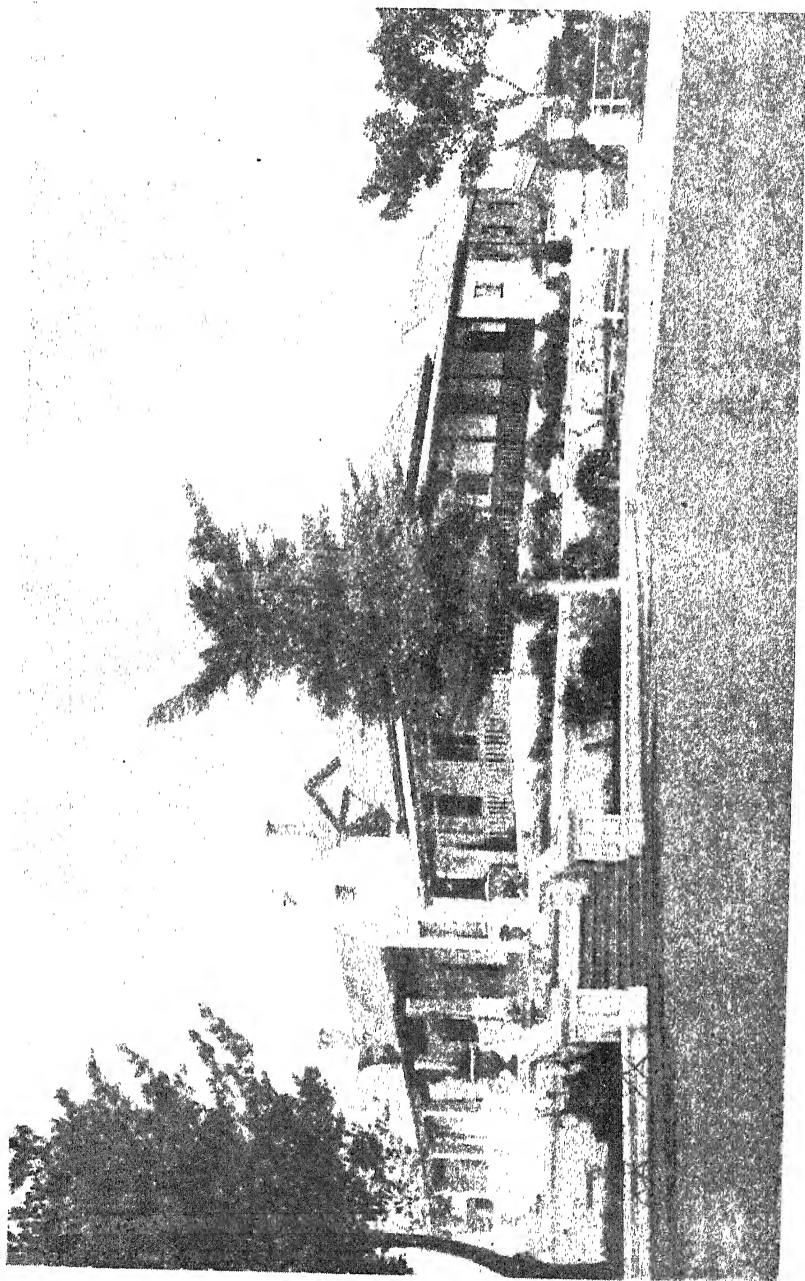
favourably situated, and with a trunk line of railway passing its borders, should have been allowed to stagnate so long is an illuminative commentary on the conditions which have prevailed in the country during the past fifteen or twenty years.

The obvious remedy, of course, is rail communication with the more central portions of the district, and great hopes are entertained of the results of the line now projected to start from Sandflats on the Midland Main Line, to pass within easy distance of the coast, and thus link up the village of Alexandria, and ultimately to be pushed further along towards Round Hill in the neighbouring division of Bathurst. This line was sanctioned during the last session of Parliament, and the whole of the farming community are looking forward to its construction as the salvation of their industries. There is but one note of regret, or rather disappointment, in connection with this scheme, and that is the decision to construct the line with a narrow gauge. The people here have great faith in the productive power of the division, and it is confidently prophesied that once they are in a position to reach their natural markets they will need more facilities than a narrow gauge line can provide to transport their output. The question of transshipment too is one that is not contemplated with any marked degree of favour, as it is feared it will add to the costs; and freight charges on bulk products are a serious factor when large quantities have to be handled. In the end, however, it is felt that even a narrow-gauge line is better than nothing at all, for it will at least help the district to develop its dormant resources and, incidentally, add to the wealth of the Colony by providing foodstuffs to supplant imports.

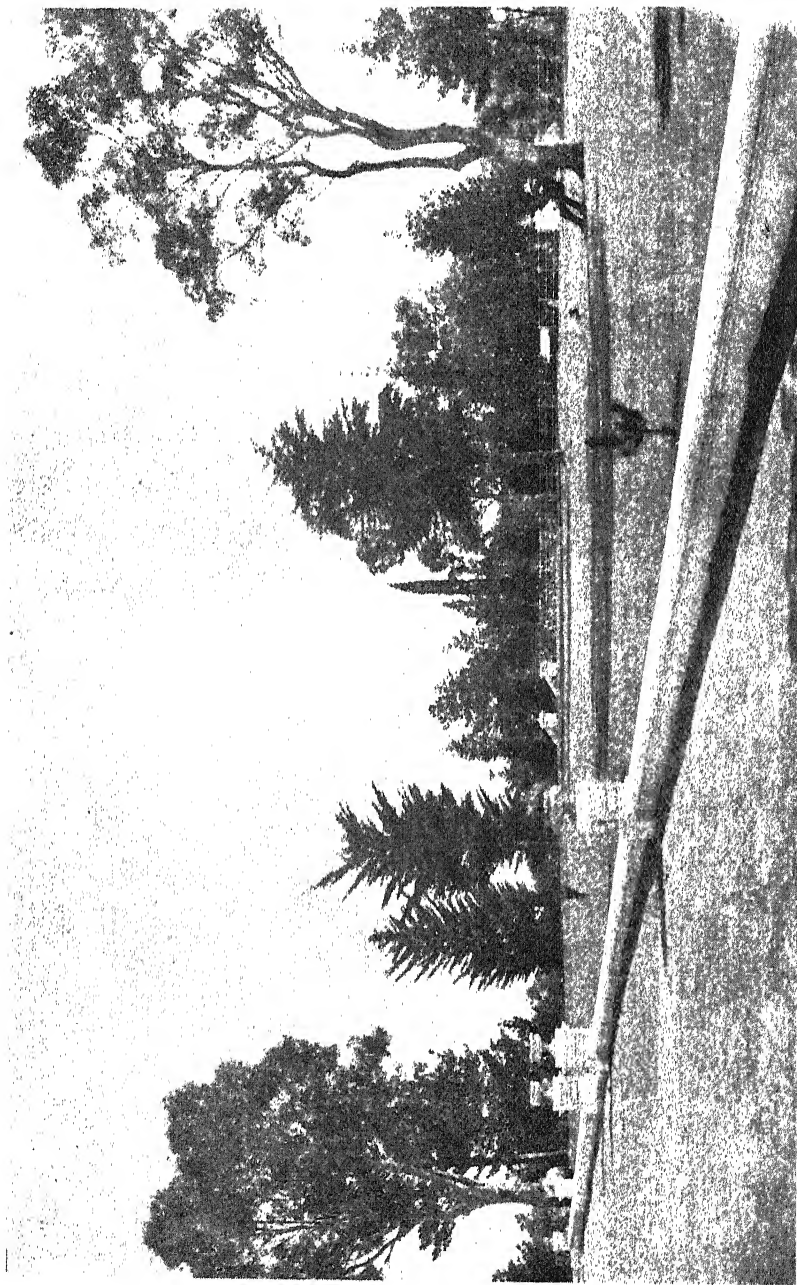
THE INDUSTRIES OF THE DISTRICT.

From what is given above it will be gathered that the industries of the district and the whole of its future must be contained in agriculture. In the past the principal output has been in the form of grain of various kinds, and it may be stated at once that cereals are the most prolific crops regularly raised so far. To give some idea as to what is being done a few statistics may prove helpful. According to the last official returns the output of agricultural produce of the division in 1905 showed the following :

Wheat	...	...	4,553 muids.
Oats	...	...	1,113 "
Oathay	...	...	1,731,187 bundles.
Barley	...	...	8,951 muids.
Mealies	...	...	7,215 "
Potatoes	...	...	2,332 "
Mangold and Beet	...	...	2,617 lbs.
Tobacco	...	...	7,775 "



An Alexandria Homestead—"Springmount," the property of Mr. John Daverin.



View of the Lawn in front of "Springmount."

To this has to be added :

Bark	...	...	409,895 lbs.
Butter	...	...	118,563 „
Ostrich Feathers	...	...	10,408 „

without counting Fruit, Wool, Mohair, and Cheese, neither of which bulk very largely in the returns. Now, the whole population of the division is given in the last Census Returns as 10,846 Europeans and Natives, and of this total the Europeans numbered 2,606. The division covers some 947 square miles. So that considering the numbers of the population, and the difficulties they have to contend against, they are not doing so badly even when left to themselves.

At one time this district carried a good deal of stock—both large and small—but this has gradually become reduced from one cause and another, though it is now on the up-grade again. Now that some knowledge has been gained of the tick-transmitted diseases, however, there can be little doubt but that in the near future stock will form a prominent feature in the general farming activities. The returns shew that there were in the district last year 20,781 head of cattle, included in which were 352 bulls, 4,346 milch cows, 6,793 oxen, and 9,290 others. This total should be very considerably increased this year, as the season has been favourable. Of horses there were about 990, mules and asses 300, and pigs 1,364. The ostriches numbered 10,359, a considerable increase on previous returns. Sheep and goats shew up very poorly. Of the former there were about 9,000, of which only 3,121 are described as “woolled.” The goats numbered 7,970, of which only 172 were Angoras. These figures speak louder than words in describing such a district. With such conditions as exist there, it seems almost absurd that the stock census should shew such poor returns, but it has to be remembered that disease is responsible for a great deal of this, and it takes time to re-stock a country reduced in this way. For all that, great hopes are entertained of this branch of farming when the country is once more in a position to introduce a little capital.

It has great advantages for stock of all kinds, for in the first place it has, generally speaking, a fairly regular and reliable rainfall. This means that the pasturage is invariably in good condition. But what is of more importance still is the fact that it is possible to grow unlimited quantities of feeding stuffs, and that is most likely the direction future developments will take. Hitherto the farmers have been content to follow in the well-beaten track, which has become a deep rut in so many parts of the Colony. Cereals with grazing for stock has filled the measure of their ambitions. But now that the inland farmers have demonstrated the value of paying more attention to animal industry, it is very certain that the full value of this phase of agricultural activity will receive more

attention in the future. In this connection it may be noted that the farmers of this Colony owe a deep debt of gratitude to the ostrich. It may be broadly accepted that the production of high-class feathers was the first incentive to the pastoralists of the Cape to turn their attention to the necessity of providing food for their stock to supplement the natural pasturage. It began with the success that attended the production of lucerne, and to-day there are so many ostriches depastured entirely on that highly nutritious plant that it is gradually dawning upon those engaged in pastoral pursuits that what has proved so remunerative in the one case might be made of equal value in others. With the rapid advance of dairying, this principle is taking deep root in several districts, for very large quantities of lucerne are now grown to be kept as hay to feed stock. In a district like Alexandria, where, as I shall shew later, lucerne can be grown without irrigation, this principle is bound to receive more and more attention as the district opens up.

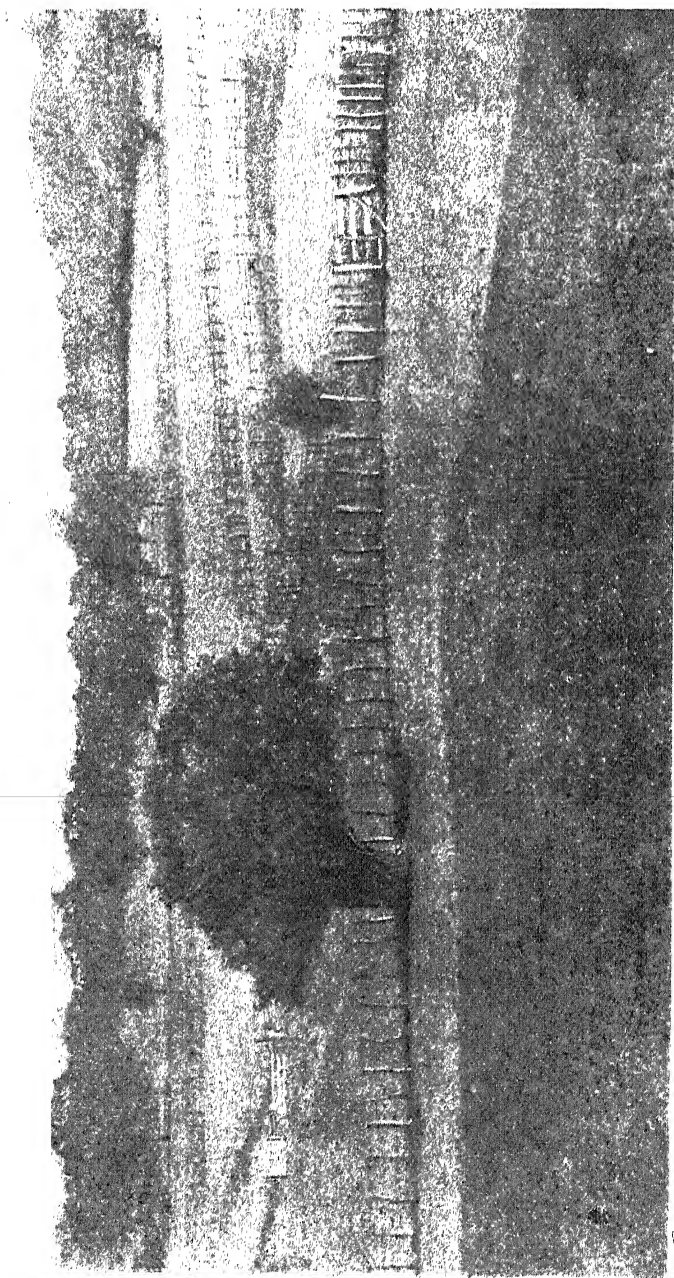
Another fine feature of the district is the favourable opportunity presented for the introduction of that other magnificent fodder plant, *Paspalum* grass. This section is a natural grass country, and with its regular spring and summer rainfall, combined with its rich, deep soils, *Paspalum* should thrive splendidly. One has only to ride along the ridges dividing the bush-clad valleys to realise what magnificent opportunities are here awaiting the man with patience and energy sufficient to establish this succulent grass. It would change the entire face of the countryside. And it would enable the farmers to establish a huge dairy industry that would vie with anything this country could ever hope to shew.

LOOSE SOILS AND DRIFTING SANDS.

There is only one danger that would have to be avoided, and that is the tendency of such loose soils when stripped of bush and its undergrowth to develop into drifting or "blowing" sands. This is a real evil in some spots now, and the introduction of more stock, with the probable denudation of bush that would take place to make room for them, would very likely increase that evil. But there is no real need to fear catastrophe, if only due care be exercised in the beginning. When these loose soils shew signs of breaking, and the herbage is stripped from them, they do not take long to develop into a menace to the farmer. But before that stage arrives the man who knows the risks he is running will take good care to have his farm divided into paddocks, so that the stock would not be allowed to remain too long on any particular portion. And should any part show signs of breaking—or "blowing," as the local phrase has it—it is only necessary to close that section to stock for a while, and the evil can soon be remedied. There are many methods advocated for the reclamation of sands, but none are so effective as a good wire fence—and rest. This has been shown in



In the Terraced Gardens at "Springmount."



View of 50 acres of Lucerne Camps for Ostriches as seen from the Lawn at "Springmount."
The Lucerne is grown without irrigation.

places like Bredasdorp, where enclosed sands have been found to become rapidly covered with natural herbage, if only left alone. This was in places where the sands had formed into really dangerous drifts, and were driven by every gale of wind further and further inland. Of course, in such a case as that it has been found advisable to supplement the natural forces by planting marram and other grasses. Where it is only necessary to guard against possibilities, as is the case in Alexandria, very little trouble need be anticipated, only provided that those who farm there are fore-warned.

MODEL FARMING IN OUT-OF-THE-WAY PLACES.

Coming down to a few details connected with the actual farming of the district, I am reluctantly compelled to state that during my visit I had very little opportunity of seeing much. I arrived there at an unlucky time for myself--though lucky for the district. It had been raining heavily for days previous to my arrival, and the rain continued so long that I was weather bound, and could not get about very much. I managed to travel over some execrable roads from Sandflats station as far as Springmount--a little more than half-way to the village of Alexandria. There I was detained by the rain, for on making enquiries I found that travelling in the condition of the country was next to impossible. I waited over, and as the rain refused to clear off, I had to make the best of a bad bargain and take the first opportunity that presented itself to get back to the railway again, for by then the time at my disposal was exhausted. However, I managed to get about a little on horseback, and as there is a good deal of similarity about these coastal sections, I was enabled to gather sufficient information to give a fair idea of the division.

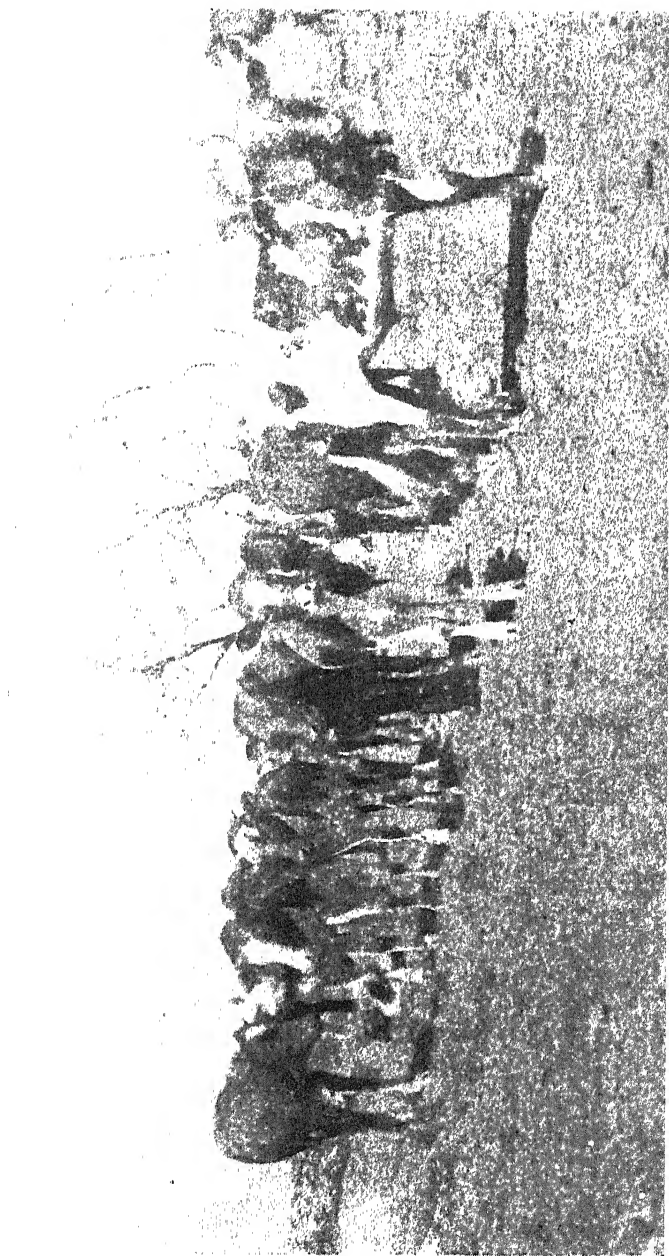
"Springmount" is a fine property, situated almost on the seashore; in fact, the boundaries of the farm march with the foreshore for miles, and it is, I believe, the finest property in the division. At any rate, I neither saw, nor heard of, anything approaching it, and I doubt very much if there is a finer farm property in the Colony of its kind. It is owned by Mr. John Daverin, of the well-known firm of produce merchants of Port Elizabeth, and here he has ridden a hobby which should not only be of great value to himself and his family in time to come, but be of even greater value to the country, for he has spared nothing in his endeavours to shew what the soil and climate are capable of. The style of buildings he has thought fit to erect can be seen in the views herewith, but excellent as these are, and beautiful as is the whole scheme of the house and surrounding grounds, they sink into insignificance compared with the magnificent work done on the farm itself.

"Springmount" to-day is the work of half a lifetime, for that is about the period which Mr. Daverin has devoted to it. He was associated with this part of the country very early in life, being an

old colonist, and although he devoted his attention largely to commerce, he has managed to find time to superintend its development, until to-day it stands out as a credit to the whole country. Originally the farm was devoted almost entirely to the raising of cereals and cattle, mostly the former. The arable lands can be seen now extending actually for a distance of some miles. Of course they are not all brought under the plough, for the excellent reason that if they were the crops could not be sent away. This continued for many years on the usual system of a short rotation with bare fallow in between. In the meanwhile the energetic proprietor devoted himself largely to the planting of trees to provide shelter and add to the appearance of the place. In the course of his tree-planting operations he has put in some 25,000 trees of various kinds, including eucalypts of several varieties, pines, cypresses, oaks, and others. And as showing how good the general conditions are, very few have failed. Among the ornamental trees the Norfolk Island Pine seems to thrive splendidly. Instead of setting the trees out in plantations or belts, Mr. Daverin has put them out largely in avenues, of which there are some miles, and by doing so has succeeded in keeping fairly decent roads on most parts of his farm. And in addition he has added greatly to the natural beauties of the spot.

THE HOMESTEAD AND OUTBUILDINGS.

All the buildings on the farm are on the most substantial scale, and though the photographic views herewith give some idea of the ornamental side, they do not show the useful portion. Useful places make poor pictures, beside such views as these. Behind the homestead are all the farm buildings, and they comprise rows and rows of barns, stables, a mill house, implement sheds, wagon and cart houses, and in fact everything that could be expected on a well-conducted arable farm. The mill is driven by steam, and has a large capacity. The barns with huge baling presses for the oathay are so constructed that they could contain many hundred thousand pounds of grain or forage at a pinch. The wagon, machinery, and implement sheds are not only capacious and roomy, but are well stocked with up-to-date implements of the best description. Years ago the crops in Alexandria used to be reaped with the sickle. This was a little slow for Mr. Daverin, so he introduced the reaper and binder, and very slowly managed to convert his neighbours to the newer methods. Of course he had the usual up-hill fight, but he has had the satisfaction of convincing those around him that he at least knew what he was doing. Of ploughs and other implements there seemed to be no end, and all in good serviceable condition, though many of them had seen much service. Even horse rakes and clod breakers, rollers and seed drills are all to be seen here including the necessary thresher.



Group of Young Mixed Cattle at "Springmount."

LUCERNE ON DRY LANDS.

The triumph of the whole farm, however, is not in its grain crops or its stock, its implements or its buildings. It is in the fact that on some fifty or more acres of land lucerne is thriving without irrigation, and giving excellent returns. This is indeed an object lesson to our farmers on the coast belt whose soil has a sufficiency of lime, and where a fairly regular rainfall can be relied upon. I have commented upon the nature of these light loams earlier, but it was only when I got in among the lucerne that I realised their great depth and quality. The lucerne stands up in grand style and if looks are any indication one can only believe that it has found a natural home. The first efforts in this direction were tried on a comparatively small scale,—a couple of acres of garden ground being drill-sown with seed. This did so well without water that the experiment was carried out on a field scale, and now there is a large flock of fine ostriches grazing contentedly on lucerne on lands which used to carry nothing but cereals. If this can be done at "Springmount," there is little reason why it should not succeed elsewhere in the district.

THE WATER PROBLEM.

This growing of lucerne on dry lands naturally leads one to the consideration of the water problem. With such unique soil formations I was not surprised to learn that efforts made so far to find underground waters have failed. The drainage through such a soil must be very clear and as there are no indications anywhere of intrusive rocks to arrest the flow of the water underground, it seems fairly certain that very little may be looked for in this direction unless it is at very great depths. So far the drill has failed to strike water although it has been sunk to a depth below sea-level. The water supply for the house is supplied by the rains, stored in underground tanks, of which there are sufficient to hold about a quarter of a million gallons. On a higher part of the farm, nearer to the afforested portion there is a fairly strong natural spring—doubtless fed by the moisture conservation of the forest—which gives a regular supply for stock purposes. But otherwise the farm lacks this essential.

ORCHARDING

is evidently something left over for future consideration for up to the present not much has been done except in an experimental form. Mr. Daverin has been much impressed with the great work carried out at the Rhodes Fruit Farms and may probably launch out in this direction later on, so soon as he can determine which varieties may prove most suitable for the conditions of his farm.

Citrus trees are at present on trial including most of the better known varieties. There are three of these small experimental groves, but they are all too young as yet to be able to judge as to how they will develop. All one can say is that for their age they look remarkably well, which is another proof of the oft-expressed opinion that for these coastal belts the citrus fruits are most suitable.

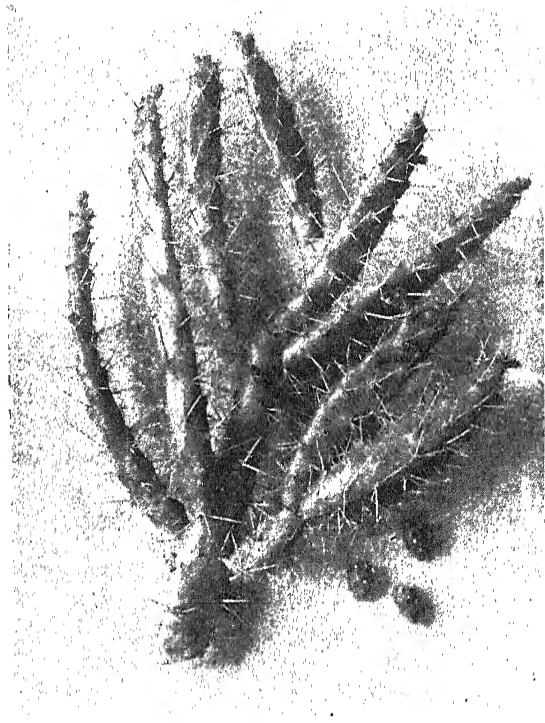
In conclusion I have to admit that it is almost impossible to do justice to all that Mr. Daverin has accomplished in this out-of-the-way spot. The house, as will be seen, is surrounded with beautiful turfed lawns, terraced so as to provide most pleasing effects. The terrace gardens are filled with gorgeous plants and flowering shrubs—and everything not only seems to thrive but grows with a profusion that is almost extravagant. This alone shews the rich nature of the soil. Even the possibilities of dairying are not being overlooked, for, in anticipation of the completion of the railway—which, by-the-way, is plotted out to pass through “Springmount”—Mr. Daverin is now busy erecting a splendid set of byres calculated to hold at least a hundred milch cows. He has not very much milking stock on the farm at present, though a fair supply of butter is kept up, but he fully intends adding to them as soon as he can, so as to be prepared for the time when the products can be sent away. With the assistance of regular spraying—and dipping if it is found necessary—he has every confidence that stock can be kept to great advantage here. And if he will only do with *Paspalum* what he has done with lucerne, he should have one of the finest dairy farms in South Africa before many years are over. The grandeur of those rolling hills and downs would be even grander still were they all, as they should be, clothed with the lush grasses they are so eminently fitted to carry.

As giving some indication of the productive power of the district, Mr. Daverin assured me that in the year 1886 “Springmount” alone turned out no less a quantity than 1,700 tons of cereals and potatoes: Of course he could not get it away, and large quantities rotted on the ground. Since then his activities have been bounded by the transport he can command. The farm is managed by a nephew of Mr. Daverin, Mr. W. Bowen, who, in addition to being a hard-headed, practical farmer, is a keen experimentalist. In such hands there can be little doubt as to the future, and if the rest of the division develops on the same lines when the railway is running, a huge step should soon be taken towards solving the foodstuffs problem of South Africa.

NOTES ON THE JOINTED CACTUS.

(By Dr. ERIC A. NOBBS, Agricultural Assistant.)

The much abused prickly pear has at least some use as a famine food, but its relative, the jointed cactus, is absolutely without any redeeming feature, and is of the two the greater evil, though the smaller. *Opuntia pusilla*, Haw, is technically and aptly described as one of the pin pillows. Indeed the joints are very like pincushions but for the notable difference that the points, not the heads, stick outwards. This cactus, nearly related to the prickly pears, has, as compared to them, quite a different habit of growth, being much smaller and creeping flat along the ground, seldom rising two or three feet into the air. The joints, which are only about the size of a man's thumb, are narrow and elongated, and only slightly flattened. It frequently starts in the



Typical Specimen of Jointed Cactus.

shelter of some bush, whence it rapidly spreads in all directions. Each joint is armed all over with long barbed spines, and it clings so tenaciously to anything that comes in contact with it, such as an animal's foot or muzzle, that the joint breaks off and may be carried a long distance before being dropped. And where it falls it grows again readily. Not only does it cover the land, to the

exclusion of edible herbage, but it injures stock by causing much pain when it happens to catch their muzzles or eyes, or becomes fixed in the feet.

In this way it gets carried all over the veld and from one district to another. Less conspicuous than the prickly pear, the jointed cactus is spreading rapidly, and its presence is often unnoticed until it is already beyond control.

The origin of this pest is particularly interesting and was given in evidence before the recent Select Committee of the House of Assembly appointed to enquire into prickly pear and jointed cactus by Mr. Leonard, of Prospect, Bedford, in the following terms:—"I will give you the history of its introduction. In the front garden of a house belonging to a neighbour of mine, Mr. Botha (the house was formerly occupied by Mr. Pohl) was a flowering cactus plant. Mr. Botha, however, soon came to the conclusion that it was a useless plant and taking it out threw it into the river. This was in 1874; shortly afterwards we had heavy rains in the district, the rivers overflowed and in that way the plant was spread down to the river's mouth. All the farms below mine have cactus."

The farm referred to is Goliath, Wagen Drift on the Kaga River, Bedford, though whence the prickly cactus came and how it reached that farm remains unexplained. From there it has spread far and wide and is now to be found in any of the following districts: Albany, Alexandria, Bathurst, Bedford, Cradock, Fort Beaufort, Humansdorp, King William's Town, Peddie, Somerset East, Stockenström, Uitenhage, Victoria East, and probably in others from which it has not yet been reported.

Dr. Marloth called attention to the plant in 1892. Periodically the subject arouses public attention but no satisfactory method of coping with the plague has yet been found. It is true that on the Uitenhage commonage a very heavy application of arsenite of soda to the growing plants proved fatal, but it still remains to be seen whether this is practicable on a large scale. Arsenic is a costly specific and one not safe to use too freely. The surest method of eradication is to dig the thing up, pile it on to bushes and apply arsenite of soda just as is customary with prickly pear, but in carrying out this work there is every likelihood that fragments will get broken off and as these are small and readily disappear from sight especially in newly dug ground, it is hardly possible to clear land in one or even several operations. This is quite different from the case of prickly pear with its big bright green joints that can hardly get out of sight.

There are strong reasons against declaring the jointed cactus a noxious weed in terms of Act 40 of 1889, although this step has in certain cases been taken. The great cost and labour involved also place eradication beyond the power of many land-owners. For this reason the proposal has been made that badly infested

areas should simply be fenced off and all stock excluded, and of course the spread across the fence line rigidly prevented. Unsatisfactory as such a plan obviously is, it has yet much to commend it, especially on the score of cheapness. Buck, hares and *homo sapiens* would have to be watched, and constant inspection would be essential.

Experiments are at present in progress to try to find some practicable means of destroying this insidious foe; meantime farmers would be well advised to keep a sharp look out for the plant and nip it in the bud.

COMMON SENSE CALF FEEDER.

Our attention has been called to the Common Sense Calf Feeder which is new to South Africa. It appears to answer the purpose and has been largely taken up in Europe and America. With the advance of dairying our farmers must look for all the assistance they can get from devices of this description. It costs little, is easily fitted and—most important of all—is easily cleaned. Any feeder that cannot be easily cleaned or is not kept clean when in use is a death trap. Messrs. M. M. Steytler & Co., of Port Elizabeth advertise this line. They also call attention to the improved Osborne Mower with the vertical lift that throws the machine out of action at the same time that the knife is levered up into the catch. Another line they are calling attention to is the “Perfect” Cream Separator a simple machine with few parts that need cleaning. The “Perfect” took first prize for clean skimming at the Port Elizabeth Show last year.

SALTBUSH.

Mr. Herbert Alston, of Van Wijk's Vlei, informs us that the demand for Saltbush seed has spread to German South-West Africa. He also asks will those correspondents who write to him please be careful to enclose a clear and full address? We often have the same complaint to make. People will send letters with illegible signatures and unreadable or insufficient addresses, and then they blame others when they receive no answer.

As the interest in Saltbush is growing apace, we have been requested to reprint some short instructions as to its propagation.

To introduce Saltbush on to a piece of brak land a good plan is to loosen the soil with a spade or hoe in patches some little distance apart. Some advise a patch every 6 to 8 feet, others say every 10 yards, but in the latter case the plants must be allowed to flower, so as to spread seed all round. Six to 12 seeds are dropped on each prepared patch and covered to a depth of $\frac{1}{4}$ to $\frac{1}{2}$ an inch. A thorny bush is then placed over the seed, so as to shelter the young plants until the stalks become woody and hard. The quantity of seed required will obviously vary with the distance apart of the patches, but as about 20,000 seeds go to the pound weight, very little is needed. Ten seeds every 2 yards, which is a generous allowance, means only about $1\frac{1}{4}$ lb. per morgen, while at 10 yards apart this is reduced to about $\frac{1}{2}$ a lb. per morgen. It is said that if the seed does not get water within 5 or 6 days of being sown, it dies, but there seems to be some doubt on the point. One or two wettings, whether from rain or by flooding, are sufficient to ensure its growth.

Another successful plan is to sow the seed broadcast over the veld *during* rain, and then drive a flock of small stock back and forward to tread it in. Much more seed, say 8 to 10 lbs. per morgen, will be necessary for this method, and stock must be kept off the area for some months after, as thorn bushes cannot be used to protect the young plants as in the system first detailed.

Land which has been under cultivation, but has become brak, may with advantage be sown with Saltbush. The land may be ploughed and the seed dibbled in, or a furrow may simply be drawn every few yards and the seed sown in the loosened ground and covered with a second furrow. It will spread naturally very fast on tilled ground.

If any difficulty be found in getting Saltbush to grow from seed, then it can readily be propagated from cuttings buried some 8 inches in the soil; this is, however, a slow and somewhat laborious method.

Saltbush seed may be sown at any time of the year when the soil is moist, except during the winter, and, so far, no particular season has been found to be best.

All Saltbushes prefer moist, brackish land, but are able to accommodate themselves to a great variety of conditions.

LIFT IRRIGATION IN INDIA.

Mr. Alfred Chatterton, the Madras Professor of Engineering, has recently published an exhaustive treatise on "Lift Irrigation," with the object of supplying information regarding mechanical methods of lifting water and of demonstrating that their employment in the South of India has been attended by material development common to modern agricultural practices. The author advocates the use of oil engines and centrifugal pumps as, by their simplicity and efficiency, they are admirably adapted to meet the requirements of the larger landholders. The use of windmills is also advocated, as, from the results of experiments made in Madras, it appears to be clear that there is a wide field for their employment. Very rapid progress is being made with the development of oil-engine irrigation in Madras,

During the last two years it seems that about forty oil engines and centrifugal pumps have been installed in the Madras Presidency for irrigation work, and the number is very rapidly increasing. Centrifugal pumps should not always be employed; in certain places it would not be worth while, and the windmill is the best mechanical method to deal with small quantities of water. Mr. Chatterton does not think the present form of windmill is capable of much improvement, though the ideal irrigation pump has yet to be designed, therefore he would not recommend the wholesale introduction of windmills. Nevertheless they are, he says, admirably suited to the wells of India, and he urges continued experiments with windmills.

The gradual expansion of water lifting by mechanical means, whether it be by the oil engine and centrifugal pump, by the windmill and reciprocating pump, or by various water-lifting devices, driven by electrically distributed power is, therefore, to be welcomed as a material contribution to the development of the agricultural resources of India, since there is no doubt that they will help to increase the supplies of water available for irrigation. So great is the importance Mr. Chatterton attaches to the subject on which he writes that he urges upon the Government the desirability of granting loans to cultivators, specially to enable them to secure mechanical power for raising water. Mr. Chatterton also strongly recommends that all wind-mills erected for lifting water should be arranged so as to be able to drive two pumps during periods when the wind velocity is sufficiently high.
—*Commercial Intelligence.*

WESTERN PROVINCE AGRICULTURAL SOCIETY'S EGG LAYING COMPETITION.

Record of Eggs Laid from 18th June to 24th November, inclusive.

Pen No.	Breed.	Pullet No.	Eggs Laid.	Points.	TOTALS PER PEN.	
					Eggs.	Points.
1	Buff Orpingtons ..	1*	4	8	229	412
		2	85	170		
		3	52	88		
		4	88	176		
2	Partridge Wyandottes	5	56	84	206	351
		6	46	79		
		7	58	113		
		8	46	75		
3	White Wyandottes ..	9	91	175	341	619
		10	101	202		
		11	99	191		
		12	50	81		
4	White Leghorns ..	13	108	209	396	680
		14	102	181		
		15	77	148		
		16	109	192		
5	White Wyandottes..	17	65	129	268	485
		18	53	102		
		19	70	138		
		20	80	116		
6	Buff Orpingtons ..	21	82	164	258	511
		22*	10	20		
		23	91	179		
		24	75	148		
7	Plymouth Rocks ..	25	83	129	303	479
		26	50	58		
		27	85	160		
		28	85	137		
8	Brown Leghorns ..	29	81	143	213	400
		30	40	74		
		31	43	86		
		32	49	97		
9	Buff Orpingtons ..	33	78	154	274	530
		34*	1	2		
		35	101	202		
		36	94	172		
10	White Leghorns ..	37	66	132	274	522
		38	71	138		
		39	71	127		
		40	66	125		
11	Buff Leghorns ..	41	71	141	271	531
		42	70	140		
		43	61	113		
		44	69	137		
12	Buff Orpingtons ..	45	85	143	261	477
		46	85	165		
		47	86	161		
		48*	5	8		

*Dead.

Western Province Agricultural Society's Egg Laying Competition—*continued.*

Pen No.	Breed.	Pullet No.	Eggs Laid.	Points.	TOTALS PER PEN.	
					Eggs.	Points.
13	Buff Orpingtons ..	49*	75	146	290	568
		50	82	162		
		51	63	124		
		52	70	126		
14	Buff Orpingtons ..	53	75	140	308	566
		54	99	166		
		55	62	124		
		56	70	136		
15	White Wyandottes ..	57	52	63	196	332
		58	71	142		
		59	55	107		
		60	18	20		
16	Black Orpingtons ..	61	63	125	243	484
		62	47	94		
		63	59	118		
		64	74	147		
17	Buff Orpingtons ..	65	52	103	205	345
		66	28	45		
		67	60	67		
		68	65	130		
18	White Leghorns ..	69	49	91	326	619
		70	93	168		
		71	93	185		
		72	91	175		
19	Brown Leghorns ..	73	81	151	313	527
		74	80	154		
		75	86	92		
		76	66	130		
20	White Leghorns ..	77	69	138	241	469
		78	81	159		
		79*	19	34		
		80	72	138		
21	White Leghorns ..	81	26	52	160	313
		82	50	100		
		83	30	60		
		84	54	101		
22	Buff Orpingtons ..	85	53	104	248	439
		86	67	125		
		87	62	96		
		88	66	114		
23	Buff Orpingtons ..	89	103	189	284	543
		90	64	126		
		91	85	164		
		92	32	64		
24	Plymouth Rocks ..	93	49	74	191	296
		94*	37	70		
		95	59	63		
		96	53	89		

In scoring, 2 points are given for every egg weighing over $1\frac{3}{4}$ ounces, and 1 point for every egg weighing $1\frac{1}{4}$ ounces or less.

* Dead.

AGRICULTURAL SHOW DATES, 1907.

- Paarl, on Thursday, January 24.
Stellenbosch on Thursday, January 31.
Bredasdorp, on Thursday, February 7.
Aliwal North, on Tuesday and Wednesday, February 12 and 13.
Malmesbury and Piquetberg, at Malmesbury, on Wednesday, February 13.
Robertson and Montagu, at Robertson, on Wednesday February 13.
Caledon, on Thursday, February 14.
Bayville, on Friday, February 15.
Western Province, at Rosebank on Tuesday, Wednesday, and Thursday, February 19, 20, and 21.
Queenstown, on Wednesday, Thursday and Friday, February 20, 21 and 22.
King William's Town, on Thursday, February 28 and Friday, March 1.
St. Mark's Agricultural Society, at Cofinvaba, on Friday, March 8.
East London, on Thursday, Friday, and Saturday, March 7, 8, and 9.
Barkly East, Wednesday, March 13. Judging on Tuesday, March 12.
Molteno, on Tuesday, March 19.
Humansdorp, on Wednesday, March 20.
Bloemfontein, on Tuesday, Wednesday, and Thursday, March 19, 20 and 21.
Oudtshoorn, on Wednesday, Thursday, and Friday, March 20, 21, and 22.
Umtata, on Thursday and Friday, March 21 and 22.
Midland Agricultural Society (Graaff-Reinet), on Tuesday and Wednesday, March 26 and 27.
Wodehouse Agricultural Society, Dordrecht, on Wednesday, March 27.
Albert Agricultural Society, at Burghersdorp, on Wednesday and Thursday, March 27 and 28.
Bathurst, Wednesday and Thursday, March 27 and 28.
Cradock, on Tuesday and Wednesday, April 2 and 3.
Albany Agricultural Society, at Grahamstown, on Thursday and Friday, April 4 and 5.
Cape Flats Farmers' Show, Wednesday, April 10.
Port Elizabeth, on Wednesday, Thursday, and Friday, April 10, 11, and 12.
Eliot, on Wednesday, April 10.

CORRESPONDENCE

Correspondence and contributions are invited on all subjects affecting the Farming Industries of South Africa, suggestions for consideration or hints as to improved methods being particularly welcome.

Questions are also invited. In this department, every endeavour will be made to procure the desired information for publication in the next issue, but this cannot be guaranteed in the case of letters received after the 20th of the month. Should a correspondent deem his enquiry urgent, he should say so, and an answer will be returned *through the post* as soon as possible.

All letters or contributions should be plainly addressed: "The Editor of the *Agricultural Journal*, Department of Agriculture, Capetown;" they should be written on one side of the paper only, and be accompanied by the name and postal address of the writer, not necessarily for publication, but as a guarantee of good faith. A *nom de plume* may be attached for publication.

The Castration of Ostriches.

Mr. P. M. Southey writes:—"The account I sent you as the result of my experience in the current number of the *Journal* seems to prove of great interest to the Ostrich Farming community. It would be interesting to hear the experiences of others. I believe it was tried by Mr. Walter Murray of Roodebloem, District Graaff-Reinet, Mr. S. H. Gilfillan, Glen Heath, Conway, and several other leading farmers. Will those gentlemen be good enough to publish in the *Journal* their opinions? Some half a dozen farmers with whom I am acquainted who were particularly keen on it, all discontinued. For what reason otherwise but that the experiment proved unsatisfactory?

"The value of the ostrich feather consists of its richness of flue, which we are all working for at the present time. A castrated cockbird will not produce so rich a quality of feather as he otherwise would, as an instance compare a gelding with an entire. What a contrast there is. The latter has a soft silky rich coat, and more life and spirit in the animal himself. The idea as claimed was a good one had it worked, viz., to do away with veld nests, prevent challenging and rolling, thereby damaging the tips of the feather, content in camps, therefore keep in better condition etc., etc. On several occasions for devilment I operated on some young springbuck in their wild state and eventually shot one when full grown. The general appearance of this buck was very effeminate. His horns had not developed, neck thin, otherwise in splendid condition. I did not take particular notice of the general appearance of his coat or skin as regards gloss. His condition of course gave him a sleek look."

Locust Destruction.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Locusts have been hatching out again in myriads, and a great deal is said about killing them, various ways being prescribed. The latest receiving Government aid is to spray them with dip—chemical or arsenical or soap suds. Whether any spraying will work effectively without collecting or trapping your locusts first is very doubtful. I have experimented in different ways on small swarms. Result: as an average, you hardly destroy one half. As far back as 1891 I tried digging holes and covering the sides with some screening. It worked very effectively; only the labour to dig the holes and the want of sufficient screening made me abandon it.

Now I have successfully destroyed three ordinary swarms by using galvanized iron sheets beaten out smooth, cut into four strips for screening and into two strips for a final enclosure. Once trapped destroying them is nominal. One gallon chemical fluid with a watering can, using three-quarters of a bottle of fluid to a gallon of water killed the lot; whereas nearly the same quantity of dip used on a small lot sleeping on bushes majority revived.

On an attempt to destroy another reported swarm some distance from the home-stead, I found it would require about half a mile of screening to trap them. I did not have it, so let them go. Still the conviction is there—that with combination, practical work, and some experience a great deal might be done. Total eradication is not expected.—Yours, &c.,

J. W. VAN ZIJL.

Tzamenkoinst, Dist. Colesburg, Nov. 14.

The Divining Rod.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have read several interesting letters lately in your Journal on the above mysterious subject; the last and not least being that of Mr. G. J. P. Sinclair, in the October edition. Among the thousands of instances of futile results of this "Divining Rod." I am able to testify to one I have just experienced. On this occasion the applicant for the Drill—after three unsuccessful attempts with the Government Water Drill—decided to put the properties of the "Divining Rod." to the test. The services of a gentleman well-known in the capacity of indicating water by this method, were consequently secured and in the presence of witnesses and the applicant, I planted the machine on the "Divine" spot and immediately began operations. At a depth of 80 feet a "trickle" of approximately 4 gallons per diem was struck. Drilling was continued and at a depth of 326 feet the total supply was 28 gallons for 24 hours. I may mention here that the indication as depicted by the sticks, was announced by the "Diviner" to be of an exceptionally favourable character; also that the water found at 80 feet, was also found in the other Bore-holes at approximately the same depth, over which holes the stick was inactive. Before boring commenced, the "Diviner" expressed with confidence his assurance of an inexhaustible supply of water being found at a depth of less than 100 feet. The gentleman referred to as the "Diviner," is to the best of my knowledge an honourable man held in high esteem by all who know him and did not charge for his services. Some weeks ago I also read a short statistical account in the *S.A. News* of some 50 or 60 Boreholes sunk in German S.W. Africa for the use of the troops in operation there. In this account it seems that a very high percentage of the holes bored (in fact almost all) yielded water at reasonable depths; and here the success was entirely attributed to the qualities of the "Divining Rod." I quote the foregoing account simply with the view to place before the professors and enthusiastic supporters of the "Divining Rod." the following few questions:—Firstly—Why should there be a percentage at all of successful boreholes on the indications of the stick? and—If there are exceptions or diversions in the water finding properties of same, what prompts the adherents to the theory, to attribute water as the medium of attraction? I say theory, as I regard same as an improbability and far away from the facts and deductions of practical science, which to my knowledge has not as yet expressed any authority on the matter.

The above would seem exhaustive to the propounders or defenders of the Stick theory when we regard Mr. Sinclair as an expert authority, stating that the waters of rivers and pipes do not affect the "Divining Rod;" and remembering in the mean-

while that according to this theory, water is the medium of attraction. Secondly,—Why should I invariably strike water wherever I drill, without the application of the “Divining Rod?”

As I have already mentioned, it does not seem as though the matter had, as yet, been submitted to scientific investigation,—as I can nowhere trace any research reference to the mystery—unless it had been rejected as too trivial a subject for the valuable time of a philosophical student.

Mr. Sinclair records his experience with the “Divining Rod;” but he fails to deal effectively and in a reasonably explicit manner with the cause or causes of its effects. He has, however, hit the element akin to what I would regard as the more acceptable and possible classification, which in my opinion, would be magnetism instead of electricity; but instead of this force being present in the water, I should more reasonably foster the idea of a magnetic vein livened to increased attraction by the presence of moisture—or water probably, in most cases. Hence it would seem easily conceivable that this force would make itself manifest through a terminal of greenwood (which is conductive) connected to the human nerves by way of the hands. Convinced of this or some similarly reasonable mechanical theory, I can in indicating same do no more than make the following proposals to Mr. Sinclair, viz.:—That I would undertake to drill alongside of, and at a distance of not less than say 5 or even 10 yards from the so-called “vein” (which Mr. Sinclair asserts to be from 3 to 5 feet wide) indicated by the “Divining Rod,” and will in most cases, if not in all, strike the same quality and quantity water, at more or less (according to the Geological conditions) a similar depth as that struck on the “vein.”

The latter, however, I deny from a Geological standpoint, to exist, except in rare instances. My assurance and confidence of such being the case is substantiated by the fact that the upper crust of the earth is built up in a series of sedimentary strata, or layers of sediment indicating the deposits of different and successive epochs. It is between these layers that occasionally, subterranean water is found; and this seems to happen—as proved by boreholes—when water is retained between a lower impervious stratum and a porous upper layer of substance. Now from a common sense point of view, I should agree with modern authoritative Geology, that the most appropriate name for this water-containing space would be, a “water-seam” and not “water vein,” which later is misleading and which generally conveys to the ordinary mind an idea of a natural underground pipe or longitudinal cavity. That such do exist in rare cases, where probably volcanic action had been the principal cause, I do not deny; but to assert that these are the exclusive sources of underground water, only to be determined conveniently by the “Divining Rod,” would be both irrational in the face of modern research and not to say the most, ridiculous. The former conception has obviously found its origin in early ages, when “speculation” was the only solution to the “wonderful” and a knowledge of natural laws and natural phenomena was unborn in comparison to the present time. And to this I think, its “Divinity” (if I may use the word) can generally be ascribed, especially in this country.

It is well-known and perhaps best known to the “Diviner” himself, that the farming public are mostly indifferent about the phenomenon of the “Divining Rod,” although, at the same time cherishing a form of faith in the stick, for the want of a reasonable explanation regarding the causes of its apparent vitality.

In contrast to this, I would urge a cultivation of a “desire to know,” by the growing generation and this can only be rewarded with satisfaction by a development of honest research for the truth and discarding the untenable and superstitious view hitherto held on the matter.

Thanking you in anticipation of having the above published in your columns, and sincerely apologising for the undue space it may require.—Yours &c.

C. E. LIEBENBERG..

Piquetberg, Nov. 11.

The Great Lamziekte Controversy.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I addressed the enclosed letter to the Griqualand West Farmers' Society, but, unfortunately it reached Kimberley after the meeting was over and I therefore asked that it be returned to me. I ask you to be good enough to publish the same in the *Agricultural Journal* as I wish to invite correspondence on this vital matter. I

have still abundance of evidence which will go to prove that this so-called lamziekte has gradually infected the veld on the Kaap-range, and is doing the same between the Harts and Vaal as well as in, and around Kimberley, portions of the Orange River Colony, and the Western Transvaal.—Yours, etc.,

GERALD DONOVAN.

Blikfontein, Barkly West.

To the Secretary,
Griqualand West Farmers' Association, Kimberley.

SIR,—Seeing that a second meeting will be held next Saturday to consider lamziekte I regret that I am unable to be there. I have therefore made up my mind to write a few lines and put on record my experience regarding the so-called lamziekte since I have farmed in this country from the year 1873.

In 1873 I crossed the Harts River and took possession of Donderbosfontein and in 1874 I annexed Klein Boetsap. On these farms the natives had many cattle, and as no disease seemed to trouble them I decided to embark in cattle farming. During the time of my occupation of the above farms in company with the brothers Hemper we had 100 head of oxen at Boetsap and 350 head of breeding cattle at Donderbosfontein which in 1878 I sent into the Orange Free State to prevent their falling into the hands of the Natives. *We lost none from lamziekte.*

In 1874 I visited Manerin where the Chief Janki Mothibi was then residing, and I passed this farm on my way.

Here as well as at Gamazeppe and Manerin there were large herds of cattle. I visited the Griqua Town District in 1872 and 1874 and came back *via* Daniels Kuil, finding large herds of cattle in the districts mentioned. Lamziekte was unknown, and made its appearance after the war of 1878.

This is corroborated by many old Natives and Griquas in this country.

This fact, goes far to prove that the fatal disease which has gradually spread and which is still spreading like a black cloud is due to some infectious matter which like anthrax infects the veld.

If any animal suffers from the want of phosphates there is nothing like bonemeal to bring it into condition.

At Donderbosfontein during the drought of 1873 I had some cows suffering from stijfziekte, but as soon as the rains came and the veld became green the symptoms of stiffness disappeared.

The question is, will bonemeal prevent or cure the disease which kills cattle in 36 to 48 hours?

From personal experience, I say decidedly,—*No*. Many years ago Messrs. Mayers & Plater of Grootfontein and myself, gave our cattle as much bonemeal (*viz.*, bonemeal made from burnt bones) as they could eat. We mixed the salt and bonemeal, half-and-half and kept the mangers full winter and summer but, in spite of this being continued for years before the war, we nevertheless lost cattle from this so-called lamziekte.

I discovered, and many others have done the same, that our cattle were not suffering from the want of phosphates but some disease which affected the stomachs of the cattle. The excreta from the animals was full of inflammation, and covered with a bloody mucus; the throat was more or less inflamed, and often the animal refused to swallow mealie meal gruel, cooked for its benefit. In a day or two the animal would stop ruminating and would prefer lying flat on its side; the pains in the stomach gradually growing worse and the animal would groan with pain and point with its head to the spot, eventually dying.

I have had all cut open and have carefully examined the stomachs which shew great inflammation.

If anything eats of the contents, whether it be cattle, donkeys, goats, fowls etc., the disease is transmitted to the creatures eating of the same and they are sure to die.

A beast suffering from ordinary lamziekte or the want of phosphates I have also had experience of. Although paralyzed, such animals will eat and drink as long as you supply the food. They shew no internal inflammation, and if bonemeal is given daily and the animal swung between four posts daily for a couple of hours it will recover within a month.

In the winter rarely a case occurs, which would be considered the proper time for lamziekte due to a want of phosphates, whereas with the spring our trouble begins, and it lasts until the first frost in May or June. Does this not go to prove, that Mr. Bowhill is correct in pointing out that our cattle are dying of *Pasteuralla bovis* and not from the want of phosphates?

When I read the report of this gentleman I came to the conclusion, that he had diagnosed the so-called lamziekte correctly, and the sooner this fact is recognised, the better it will be for all of us and South Africa generally.

What we require now is a scientist who can make cultures and find out if our cattle are not dying from the Pasteuralla bacteria and then find a cure.

For this disease, which has already cost us dearly, bonemeal is all moonshine, and the sooner we face the same squarely, the better for all interested in cattle farming.

Hers we have no anthrax, but every summer we have the so-called lamziekte, and if the Agricultural Department wishes to test the same, they can come here and do so. There are 170 head of cattle on this farm, and there should be no difficulty in getting at the root of the evil.

I have written the Department that it can make experiments here, as I am anxious to have this disease diagnosed.

The suggestion by Mr. Gunning to manure the veld, in this country would be well suited to the time of our fore fathers. What is it going to cost, and who can say it will prevent the disease which has been killing our cattle for 26 years?

I have received the following from Mr. Bowhill:—

“Grahamstown,

19th August, 1906.

Sir,—Your letter of the 10th inst. duly to hand. Your surmise *re* the lamziekte is perfectly correct, and agrees with my observations along the coastal area. I left the service of the Colonial Government on the 14th inst., and I may state that my departure, if not caused by my crusade against bonemeal and the fallacy of the phosphate theory of Mr. Hutcheon, was at least hastened by my determination to oppose to the bitter end the bonemeal panacea (2). Lamziekte is nothing but *Pasteurella brevis*, and in those cases that last for several days, the poison elaborated by the bacteria invades the nervous system, thus affecting the brain and spinal cord. I have tried a lot of treatment here, but can only recommend you one thing that is good—that is the administration of Stockholm tar, *two tablespoonfuls* on the tongue of each animal every 14 days during the lamziekte season (here it is from the end of October until the end of May).

Now regarding the treatment, write to Mr. Thomas, Hillary Farm, Sandflats, C.C., and he will give you all particulars. At my suggestion he has been successful with the treatment now for over two years. Other farmers have also been successful. One of the bonemeal experts threw away his last sack of bones this week.

I am leaving the country at the end of this month, and of course will not be here to see my predictions come off, but take it from me I have *discovered* the cause of lamziekte, and in Stockholm tar *have found* a splendid preventive. My reward has been—

I am,

Yours faithfully,

(Signed) THOS. BOWHILL,

F.R.C.V.S., F.R.P.S.”

I have had a letter from Mr. Thomas, who confirms the success he has met with in the use of Stockholm tar, but he advises that it be given every eight days during the lamziekte period.

If not giving too much trouble, kindly read this letter at the meeting.—Yours very truly,

J. GERALD DONOVAN.

Mr. D. Hutcheon, Director of Agriculture, offers the following comments on the above:—“There can be no longer any doubt that under the term “lamziekte” are included several diseases perfectly distinct from one another in their nature and originating cause. Some cases are infectious, or at least inoculable; amongst these anthrax is doubtless included. The very fact that several farmers in Griqualand West look upon vaccination against anthrax as a preventive of lamziekte is proof of the prevalence of anthrax, although it is seldom reported, perhaps due to the fact that reported outbreaks of that disease are followed by quarantine.

“There are other cases—non-infectious—of inflammation of the stomach and small intestines, which clearly point to the ingestion of some irritant poisonous plant. Further, many farmers know that if they turn their cattle on to certain portions of their veld, some of them will manifest the symptoms of “lamziekte” within a very limited time. This fact appears to indicate that the cattle pick up something locally, whatever it is.

"With respect to "lamziekte" alleged to arise from a deficiency of phosphates and other saline ingredients in the vegetation, the experiment at present being conducted at Koopmansfontein should decide that point once for all, if it can be continued long enough. It will decide some other points as well, which will be of equal importance. It will be something gained if we can gradually narrow the field of enquiry and be in a position to give intelligent advice."

(2) With reference to Mr. Bowhill, the statement here made is incomprehensible. The bald facts amount to this. His Pasteurella theory was given the fullest publicity in the pages of the *Agricultural Journal*, and he left the service of the Agricultural Department by resigning and *refusing to re-consider that resignation when requested to do so*. We regret this personal aspect has been introduced, but as it is made public, we are compelled, in common justice, to state the cold facts.—EDITOR, *Agricultural Journal*.

Lamziekte and the Bonemeal Remedy.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I notice a letter in your *Journal* on the above subject from Messrs. Lanham Bros., who claim to have discovered the tick that conveys lamziekte. Have they sent a specimen to Mr. Lounsbury, and is it of any of the known varieties? I cannot follow their arguments, however, as I do not see any more analogy between a lamziekte beast and a gemsbok that has been poisoned by bush ticks than there is between an ox that has got lamziekte and a bull-frog with a broken leg.

With regard to bonemeal, which our paternal Government has kindly arranged to have conveyed free to our doors, I am afraid Messrs. Lanham are very conservative in their ideas. We all know that an ounce of practice is worth a pound of theory, and I venture to think that if they will give bonemeal a thorough trial for a year, they will be as sure of it being a preventive of lamziekte as are their neighbours, Messrs. J. T. Smith, Frank Pearce, Gert Kruger, Diedrick Venter, Jan Classens, R. Turner, J. D. Aucamp, and, Yours, &c.,

W. H. WILEMAN.

Postmasburg, Nov. 14.

Geel Dikkop.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I notice a farmer signing himself "Geel Dikkop," from Beaufort West. This disease in sheep I remember over forty years in the Bedford District at Vinn Grove, Baviaans River Ward. The complaint was very troublesome. We thought by cutting down the ears, and under the chin and squeezing out the yellow glutinous liquid and rubbing in salt that it did good. I have often seen them so bad that their ears shrivel up and in some cases the eyes burst out of their heads. The description given by "Geel Dikkop" is exactly as I knew it then. The poor brutes suffered fearful agony, and would always seek cool shelter.—Yours, etc.,

WALTER JAS. EDWARDS.

Graaff-Reinet, November 1st, 1906.

Citrus Failures at Piquetberg

To the Editor, AGRICULTURAL JOURNAL.

SIR,—In the July issue of the *Agricultural Journal*, Mr. P. J. Gillie, in his report on the above, comes to the conclusion that the disease was brought about with kraal manure. He mentions that last winter Mr. Burger applied about two bushels of manure to every tree. Speaking to a farmer from the Karoo, who understands the use of kraal manure, he is of opinion that the quantity of manure given was too much, and that a large two-handfull would have been quite sufficient. Kraal manure is one of the most powerful manures and is apt to do more harm than good, if applied in large quantities. Farmers in the Western Province, who are so accustomed to using the ordinary stable manure in large quantities, should see that kraal manure is broken up fine, and strewn thinly, and then turned over with the soil. Kraal manure does not give the best result during the first season, the benefit arising from its use is seen in second and following seasons. Very little is known in the Western Province of the good qualities of kraal manure and kraal manure ash, and it would be as well if trials were made and the results published.—Yours, &c ,

J. G.

The above was referred to Mr. Gillie, who promptly replied as under :—

It is not against the manure, but the way it was applied in that special case, that I spoke. Of course, Mr. Burger could have applied double the quantity he actually used if it was spread some distance from the trees, instead of round the trunk, where it came in direct contact with the tree. It is, no doubt, one of the greatest of mistakes in using manures, both kraal and artificial, to apply the same close to the trunk of the trees, whereas it should be applied some distance away for the roots to feed on.

The Classification of Merino Sheep at Agricultural Shows.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—The remarks of the Hon. W. Rogers, M.L.C., about the classification of Merino Sheep at Agricultural Shows, contained in the October issue of the *Agricultural Journal*, are so judicious, that I am bound to confess that I could never understand why a difference should be made between a robust wool and a fine wool producing sheep, and why different classes with special prizes should be established at the Agricultural Shows in South Africa.

Mr. Rogers, your correspondent, points out with great reason, that it is the fixity of the type which should form the basis of all classes.

The main object of the existence of the Merino Sheep is the production of fine wool, for it is exclusively in that special breed where the fine wool is to be found, and the prototype of that breed is the Spanish Merino; but at the origin, although the Spanish Merino was noted for its superior fleece, the breed itself was not properly constituted, and even to-day not a single breeder in the world would resort to that prototype for the improvement of his flock, notwithstanding the fineness of its fleece. It is here that Mr. Rogers's remarks find their use. The Spanish breed had to be fixed before becoming useful for the improvement of flocks of the Merino tribe. We know to-day that the Spanish breeders have not made any progress at all, quite the contrary; they are as backwards as they were 150 years ago.

But if Spain was retrogressive, France, seeing what benefit she could derive for her sheep breeds, caused the Spanish Merino to be imported in her land; and under the clever management of Daubenton, the King of France caused the Rambouillet stud farm to be established in 1776.

The Spanish breed has since that period been so much improved that it has become an autochthon breed of the country, and is universally known as the Rambouillet breed.

This little retrospective history is wanted in order to prove that the Rambouillet is not a type but a perfect breed and a pure breed, and I would even go so far as to say the only well-established breed of Merino sheep.

The aim of sheep breeders should, therefore, be to develop in the Merino sheep its natural capacity to produce a fine fleece, and by that is meant a densely packed fairly long, yolk and well serrated wool. But in order to attain that object, the zootechnical

points of the Merino breed should not be sacrificed. And which are these points? We think it very opportune to recall them here so as to show how important they are and how well they illustrate the Merino breed.

The size of the pure bred Merino varies from 20 inches to 32. The frame is bulky, rough, and well muscled; the head is strong, and the chanfron very prominent. Rams have the horns of spiral shape more or less closely set. The ear is short and horizontal, the skin on the face is folded up in transversal wrinkles on the nose of the ram. Thick lips, large mouth, the muffle is large and mossy, the members are strong, and often long in proportion to the volume of the body.

The normal skin of the Merino is in extent superior to that of the surface of the body which causes folds to be noticed all over, the cultivation of the breed has in some cases increased them, and in some others suppressed them or located them near the neck, and caused them to fall as low down as the knee cap.

The fleece more developed, and which constitutes the principal quality of that breed covers the forehead, the cheeks, and spreads sometimes over the surface of the skin in bits, more or less densely packed, and perpendicular to the body. The wool is yolk and well serrated, and noted for its fineness.

From the above, the breeders will remark that in the sheep breeds, especially in the wool breeds of the ovine species, their interest will be to produce and to keep such types as will be susceptible by their endurance to adapt themselves to all conditions.

It must also be noted that the Merino breed as it is kept up at Rambouillet is not the object of ordinary speculation. That it is not grown for its direct production of wool or of meat, but as a flock capable before all, to give genitors, thus nothing ought to be neglected in order to obtain superior animals in their breed.

Often a great mistake is made when feeding Merinos for size, the great development and the rapid growth of the Merino is a real drawback. At Rambouillet the diet proves it. There is but one object in view which consists in the perfection of the animals. There the animals are gauged by the weight of their fleece in proportion of their live weight.

The fineness of the fleece is the consequence of the purity of the breed; one is the corollary of the other.

By keeping up the zootechnical points in the Merino, that is to say, by respecting the fixity of the breed, the breeders are bound to get superior fleeces. The Merino is a small sheep, and in order to thrive on the various pastures and under different climatic conditions, such as he will find in South Africa, he must not be amplified in the least, for it will be to the detriment of his fleece that the change will take place. There should, therefore, be only one classification, taking the Rambouillet as a standard breeder. And in that class only the animals showing the most fixity in the breed ought to be prized. Of course, in the classification, due consideration should be given to the quality of their fleeces.

Vermonts, Tasmanians, and Australians, being different types, should compete separately and be classed under so many titles, but not allowed to compete in the Rambouillet class. They should not be admitted, because they are not qualified, zootechnically speaking, to enter that class. It would neither be fair to them nor to the others.

Now, as far as the housed and unhoused breeds are concerned, the stall-fed animals should be entered under a different class to that of their veld fed brothers.

Before closing this communication, allow me to touch the subject of the wool:

Merino fleeces are of three qualities, superfines, extra fines, and fine, common and intermediate qualities also.

The good breeders of merino sheep are not deceived by the comparative fineness of the wool bits, nor are they mistaken over their evenness or homogeneity, which is due to the perfect cylindrical shape or to the evenness of the diameter in its full length.

This last quality, the even proportion of the bit, is essential, because it indicates a regular growth, an homogenous constitution of the fibre, and consequently an even stiffness of the woolly substance in its integral parts.

When the bit has a normal diameter, it can be uniformly reduced according to circumstances, and thus a relation has been found between the parsimonious feeding and the production of superfine wool, and an abundant diet and the thickening of the wool bits. But this is a mistake. The quality of the wool depends on its strength, and its strength entirely on the abundance and quality of the yolk.

Abundant and fluid yolk, consequently rich in olein, renders the wool sweet, strong, and substantial, and that is what must be looked for in a Merino fleece of good quality.

Abundant and sticky yolk, rich in stearine and palmitine, makes the wool rough and sticky, because it can less easily penetrate the substance.

The scarcity of the yolk, whatever might be its quality, but especially poor in aleine, renders the wool dry and brittle.

The fluidity of the yolk is gauged by its colour. The yellower the colour the stronger the yolk, and the paler the colour the weaker is the yolk.—Yours, &c.,

S. M. LEWIN, M.S.A.F.

Paris, 1st November, 1906.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—My attention has been called to a letter from the pen of the Hon. Mr. Wm. Rogers, M.L.C., *re* the classification of Merino sheep at Agricultural Shows.

For a long time it has been my intention to write on this most important subject, and seeing that the above-named gentleman anticipates me, I feel constrained to support his views, and to say that he deserves the gratitude of the country and of the majority of the sheep-farmers generally for his important suggestions, being fully convinced the majority will agree with him.

Mr. Rogers mentions four classes of Merinos as being of special importance to South Africa, viz.:—Vermonts, Tasmanian, Australian and Rambouillets, but I should like to add the Saxon Merino, for the following reasons, viz.:—

From various parts many visitors, or rather sheep-farmers, come to the Agricultural Shows to look for some good, thoroughbred stud sheep, in order to select one or more animals of the above classes which the would-be buyer considers best adapted to the conditions of his district. But how great must be his disappointment to see that, perhaps, a cross-bred animal was awarded the first or champion prize in the class for fine-woolled sheep, etc. This I hold to be most prejudicial to the country, as so many farmers lacking expert knowledge of the matter, are ruining themselves by breeding rams from cross-breds. Some practical suggestions on the subject appeared in the August number, under the heading "Pedigrees."

Let us, therefore, classify each pedigree sheep separately, and award prizes accordingly, so that the average farmer or breeder may know to whom to apply in future for the purchase of a pedigree animal for crossing. This, of course, will lead to the fact that crossing from pedigree stock will be looked upon as a thing of the past.

It is not for the breeder of thoroughbreds to cross-breed, but for the average farmer, who then with the first crossing may expect good results.

Take, for instance, the French National Stud at Rambouillet, also the Saxon Merino breed at Thal in Saxony, bought in the year 1810 by the late Charles Augustus Gadegast, and still kept pure by his grandson, Otto Robert. The former now enjoys an existence of over a hundred years, and if we take up the matter similarly and classify the above five breeds separately, they will be kept as pure in South Africa and ultimately save the country a considerable amount of money now spent in the importation of so many various breeds of which we hear nowadays.

In connection with artificially fed sheep *versus* grass fed sheep at shows, I agree with you that this should be taken into consideration, provided notice with testimony in writing be given, as the majority of exhibitors still go in for artificial feeding.—Yours, &c.,

J. J. DE CLERK.

Dear Fruit.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I notice in your issue for November that amongst the prizes awarded at the Crystal Palace Exhibition, there is a gold medal for walnuts grown in the district of Oudtshoorn. It is a pity that this most wholesome and nutritious fruit should not be grown more extensively in this country. What is the use of exhibiting splendid fruit in London, which, I take it, is done with a view to export? Export, indeed! We colonists must be content with an inferior article, not only as regards walnuts, but nearly all other fruit. Asking for walnuts at any grocery or fruit-shop, you are shewn a lot of miserably looking dark-brown and black things, about the size of marbles. Then there is the apple, another very nutritious fruit. It is hardly credible, but, nevertheless a fact, that at least one fruit-shop in Cape Town apples are sold at four shillings a dozen. The price of fruit, generally speaking, has during the last five or

six years enormously increased, and is now most exorbitant and prohibitive. The simple fact is that fruit, which, in this Colony, should be an article of *food* for the poor, is really an article of *luxury* even for the well-to-do.—Yours, &c.,

J. VAN DER TUEK.

Cape Town, November 6, 1906.

Poultry Diseases.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—I have great pleasure to announce, for the benefit of lovers of poultry, a safe cure for the dreaded “Blauwkop Ziekte” (the fatal Fowl Cholera), which I have tried for the last year with every success and effect.

Take the ordinary “Wilde Dagga” (young shoots or leaves preferable), boil it in water until the water is quite green, let it get cold and give each fowl a large table-spoonful. This must be given the very moment you notice the fowl becoming dejected and listless; and I would certainly recommend that every fowl, whether affected or not should be treated in the same way.

Everyone to whom I have prescribed this remedy favourably and laudably testify as to the results thereof.

The Dagga, after having been boiled, will not remain good for more than a week. I shall be glad to hear from anyone, who will try this remedy, the effects thereof.

Yours, &c.,

J. W. STIGLING.

“Fairview,” Hopefield, C.C.

Failure of Vines.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—Could you kindly give me some information about the following matter? There is something peculiar about my vineyard this year, especially the French Vines. They shoot badly, especially on the farm, where the soil is good. At first I thought it was Phylloxera, but this pest having not yet made its appearance in my vineyard, I resolved to investigate the matter, and as a result found all roots, which must supply the vine with saccharine matter, gone off four inches from the vine. The remaining portions of the roots are still in a very good condition, but the other parts are rotten. The roots which penetrate deeply, or rather, which absorb the water, are also in a good condition. The mischief is just confined to the roots near the surface. French Grape and Hanepoot suffered most. My idea is that some kind of beetle or other insect during the month of May must have caused the trouble, although no insect can be found just now, and the roots begin to shoot again. The afflicted vines will not produce any fruit this season.

Some information in regard to this matter would greatly oblige.—Your, etc ,

E. J. MARAIS, E.Zoon.

Langvlei Siding, Robertson.

We regret we cannot offer information on the description above. The Government Entomologist has suggested that specimens of the suspected insect should be submitted to him when next seen. Perhaps some of our readers have had similar experiences.

Analysis of Soils.

To the Editor, AGRICULTURAL JOURNAL.

SIR,—The subject of urging Government to have a general analysis of the soils made was again discussed by the Albany Farmers' Association on the 6th inst. Now, I strongly contend that there is no more important measure necessary in the interests of the farmers and country in general. I think I can safely say that there is no country to which we can take a back seat for variety and "cussedness" of animal diseases, and where these diseases are the most prevalent they seem to be undoubtedly caused by some deficiency in the nutritive quality of the pasture, and whatever deficiency is in the pasture is due to the soil on which it grows, being wanting in a proper and necessary combination of mineral salts, phosphates, nitrates, lime, etc., etc., to support the stock in a healthy state. As a rule, it is only when an animal is in bad health that he is subject and liable to infection and contagion and other diseases. In parts of Bechuanaland I am told the farmers can scarcely keep cattle at all owing to the terrible mortality from "lamziekte," whereas in other parts the disease is hardly known. There must be some physical reason for this, and the reason is more likely to be traced by a careful analysis of the soil than by any other way.

In some parts of this country there are practically no diseases known, "bar drought and locusts," while quite near at hand the next district is subject to all sorts of diseases. By analysis of the soils throughout the country, and by comparing the soils of the healthy parts with the soils of the unhealthy parts, it will be seen what the necessary combination of a healthy soil should consist of in mineral and phosphatic ingredients.

If the component properties of the soil where stock is healthy are different from the component properties where stock is unhealthy, it seems pretty plain that the deficiency—whatever it may be—must be substituted artificially, either by phosphatic and chemical manures or by the necessary combination of cattle and sheep "licks." Salt, bonemeal, sulphur, Stockholm tar, etc., etc., and whatever chemical and mineral ingredient is necessary.

We are all more or less groping in the dark, and many of us spending a great deal of money in experimenting, which could be better applied if we had scientific advice, and we are likely to continue so until we get a fundamental and scientific basis to work upon and start from, and this we can only get by an analysis of our soils, and the knowledge of what they are deficient in.

To me it seems of the utmost importance, so much so, that Government should be supported on the £ for £ principle, each district paying a half share of the cost incurred in the district and levied by the Divisional Council.

Nobody should object to assist in a useful investigation of this sort. It is done in all other countries, and the only reason it has not been done in this country is because Government is always hard up. We spend most of our time and money on political squabbles. But I am sure our present Government, who are the best friends the farmers have ever had, would gladly, if supported by the farmers, undertake this most important investigation. There is no farmer, whether he has a good farm or an indifferent one, that would not be vastly benefitted, by knowing what the nature of his soil was, and what that soil requires to improve it, and what his stock require to keep them in health.—Yours, &c.,

F. H. BARBER.

Grahamstown, Nov. 11, 1906.

How to Reap Large Crops in Dry Regions with Little Rain and no Irrigation.

To the Editor, AGRICULTURAL JOURNAL.

SIR.—In the *Century Illustrated Monthly Magazine* for the month of July there appears an article by Mr. John L. Cowan, on "Dry Farming." He is of opinion that a large area in the Western part of the United States of America, now considered too dry for the production of cereals and only fit for grazing purposes, may be converted into agricultural lands yielding rich harvests by the method known as "Dry Farming" or "Scientific Soil Culture." As in our western and north-western districts there also exist vast areas which on account of a scanty rainfall, during some

years at least, are too arid for the production of cereals, some extracts from the above article, are translated into Dutch in the hope that some farmers in the district of Malmesbury, Piquetberg or even Paarl and Koeberg may give the method a fair trial. The author states that, with a rainfall as low as 12 inches, it has been conclusively shewn that as good crops may be obtained as by means of irrigation.

The method has already been applied for twenty years in succession by Mr. Campbell, of Nebraska, the first "Dry Farmer," hence also the term "Campbell Method."

The leading principles of the system are as follows:—

First, keeping the surface soil loose and pulverised, allowing thereby the rainwater to penetrate easily to the more solid subsoil, and moreover preventing moisture accumulated in the soil from evaporating in the warm dry air by capillary attraction. Secondly, keeping the subsoil in a fine and solid condition, increasing thereby both its power to retain moisture and its capillary attraction; viz.: its capacity to suck up water, just like oil ascending in the wick of a lamp. The "Dry Farmer," therefore, does not collect his water in dams but in the soil beneath the plant roots.

By applying these principles, better crops are secured with a rainfall of 12 inches than with 24 inches where they are not followed. The author justly remarks that the discoverer of these principles is to be classed with the greatest national benefactors, who has not only caused two ears to grow where there was one before but has shewn the possibility of covering immense areas of thousands of square miles with crops of wheat, mealies, lucerne and other useful plants where a wild vegetation covers the soil at the present time.

The moisture in the soil both ascends and descends by capillary attraction. To prevent its ascending and evaporation two inches of it should be kept free, and at the same time all rainwater can easily penetrate to the subsoil.

To "Kielie" the ground with a plough and thus getting a crop is only true in favourable seasons when there is a sufficient and regular rainfall, but if the ground is thoroughly cultivated the crop will be far heavier in good seasons, and in dry seasons there will be no failure.

The method of cultivation is, more or less, as follows:—The soil is ploughed deep, fallowed and the subsoil consolidated by means of an implement resembling a wheel or disc harrow. The ground is then harrowed. Harrowing is repeated after each rain. At the sowing season the seed is put in, the land is harrowed, repeating this operation after each rain until the crop has grown too large to be harrowed without serious injury. After harvesting the ground is again fallowed, consolidated and harrowed, repeating the latter after each rain, until sowing time comes round again. It has been proved that land cultivated in this way produces three to five times the yield of land worked in the ordinary manner.

The author enumerates some crops which thrive on soil cultivated by this method, a variety of small mealies (Millo), a variety of lucerne (Turkestan), Kafir Corn, and six other kinds of cereals and grass.

He concludes his useful and instructive article by giving the names of some persons who farm on these lines and with success. There are indeed some agriculturists who discontinue irrigating their lands, although "dry farming" was only meant for soils which cannot be irrigated.

H. VOS STEYN, M.B., C.M.

RURAL REPORTS.

For the month ending 15th November, 1906.

Albert.—Cloudy and rainy, with high winds and every indication of more rain. Veld in good condition. Rumours of small swarms of locusts in the district. Vines in good condition, and stock doing well.

Aliwal North.—Very rainy and veld in splendid condition. Fruit crops slightly damaged by frost and locusts. Crops promising and stock in fair condition.

Barkly West.—Very little rain, and veld getting dry. Promising crop of oats expected, and stock doing fairly well.

Bedford.—Calm weather, with fine, bright, sunny days. There have been very good rains, and the veld is in excellent condition. Splendid crops, and stock doing very well.

Bredasdorp.—Weather warm and windy with light rainfall. Veld in good condition. Fruit trees in good condition. Crops somewhat thin. Stock generally doing fairly well.

Calvinia.—Weather dry and warm, with light rainfall. Veld in some parts good, and in others poor condition. Crops and stock in fairly good condition.

Cathcart.—Fair weather, with good rainfall and veld in good condition. Fruit and crops promising. Stock doing well.

Olanwilliam.—Warm weather, with a hot wind and light rains. Veld very parched. Crops in bad condition. Stock doing fairly well.

Craddock.—Promising weather with heavy rainfall and veld in good condition. Fruit and crops promising. Stock generally doing well.

Douglas.—Weather has been hot with heavy rainfall and the veld is in very good condition. The fruit trees suffered slightly from frost. Vines in fair condition. Crops doing well. Stock generally in good condition.

East London.—Windy, with light rains. Veld in good condition. Crops somewhat below the average in quantity, but promising. Stock generally in fair condition.

Fort Beaufort.—On the whole, the weather has been mild, but has varied, having been very warm at times, and at others cold. The rainfall has been heavier than usual. The veld is in splendid order, and the district is looking better than for a long time. The crops have recovered wonderfully with the late rains, and fair results are anticipated. Stock, also, has picked up considerably, owing to the good rains.

Griquatown.—Dry, hot winds have been experienced, and the veld is in good condition. Cereals, doing poorly, but stock in fairly good condition.

Gordonia.—Weather very windy and dry, and veld in poor condition. Cereals doing fairly well. Horses in rather poor condition; other stock doing fairly well.

Hay.—Warm weather with light rains. Stock not in very brilliant condition.

Herschel.—Mild weather, with average rainfall. Veld in good condition. Fruit crop has suffered from frost. Cereals promising.

Jansenville.—Weather mild and overcast during greater part of the month. Good soaking rains have been experienced, and the veld is looking well. Fruit trees promising, and abundant harvest of oats. Stock generally doing well.

Jansenville.—Heavy rains have been experienced, and the veld is in good condition. Oats doing fairly well. Stock in pretty good condition.

Keimoes.—Veld very dry, but vines and crops promising. Stock in good condition.

Keiskama Hoek.—Weather very damp with heavy rains and veld in very good condition. Fruit trees and crops in fair condition. Stock generally doing well.

King William's Town.—This month has been a wet month heavy rains having fallen and the veld is in excellent condition. Fruit crop fair and an abundance of mealies. Stock in fair condition.

Ladismith.—Weather warm and moist. Some heavy rains fell about the middle of last month, and the veld is in very promising condition. Good crops anticipated. Lucerne greatly benefited by the rain. Stock generally in fair condition.

Middelburg.—Warm weather, with good rain. Very few vines. Cereals and lucerne satisfactory. Stock in good condition.

Malmesbury.—Hot, dry, and very windy, with light rainfall. Crops not particularly promising. Stock in fairly good condition.

Namaqualand.—Fine weather, with light rains. In some parts of the district the veld looks well. Fair crops where the rains have fallen. Stock doing fairly well.

Peddie.—Weather warm, with average rainfall, and veld in good condition. Fruit not plentiful. Crops promising, and stock in fairly good condition.

Philipstown.—Splendid rain has fallen, and although more is needed, the prospects have been very considerably improved. The veld, having been in such extremely bad condition previously, still requires more rain. Very few crops here, owing to the drought, which the lucerne resisted splendidly. Stock generally in poor condition.

Piquetberg.—Weather very windy and dry, and the veld is in very poor condition. Crops not at all promising. Stock generally in fairly good condition.

Port Alfred.—Weather dull and cloudy, also changeable. Light rains have fallen. Oranges and naartjes suffering from Red Scale and apples from Aphis blight. Crops promising. Stock generally in fairly good condition.

Prieska.—Weather promising but hot. Few vines. What few crops there are are in good condition. Stock generally doing well.

Riversdale.—Warm and windy, with light rains. Veld in good condition. Crops promising, and stock generally doing well.

Robertson.—Warm weather, with light rainfall. Veld in fair condition. Phylloxera is spreading. Crops promising, and stock doing well.

Stutterheim.—Weather changeable, and veld in good condition. Fruit trees promising and stock generally doing fairly well.

Somerset East.—Weather hot, and good rains have fallen, and the condition of the veld is improving. Crops and stock doing well.

Van Rhynsdorp.—Cool weather, and veld in fair condition. Poor crop of cereals, owing to the drought. Horses in poor condition; other stock doing well.

Willowvale.—Good rains have fallen. Ploughing has been vigorously carried on, and should the rains continue, the crops should be good. Animal diseases on the decrease, and no locusts have appeared. All stock is in fairly good condition, and improving. No variation in prices.

THE TRANSKEI.

For the month ending 30th October, 1906.

Flagstaff.—The rainfall registered during the past month was 2.99 inches. Most of the natives have finished ploughing and there is every prospect of a good season. The veld is in excellent condition, and stock, both large and small, are picking up fast. No disease of an infectious or contagious nature was reported.

Kentani.—The fine rains reported last month have continued and the natives are busy ploughing. Lungsickness has appeared in several parts of the district and outbreaks of Quarter Evil have also occurred. Otherwise stock is looking well. The cattle dip now in course of construction will be a great benefit to stock owners.

Lusikisiki.—Plentiful rains have continued to fall during the month, and ploughing operations are in full swing. Pasturage is plentiful.

Mount Frere.—Splendid rains fell during the month and the veld is now in excellent condition and all classes of stock improving. Ploughing operations are being pushed on and shearing is now begun. Slaughter stock is still very scarce. Fat stock, if procurable, will realise high prices. Lungsickness is still prevalent. There have been three fresh outbreaks during the month and two herds have been released from quarantine.

Nqamakwe.—Very good soaking rains fell throughout the district during last month, and the Natives have cultivated their lands extensively. A destructive hail-storm travelled through a part of the district on the 15th October, destroying in its track all the crops and fruit which had formed or was in process of forming on that date. The condition of stock is normal. No locusts have appeared.

St. Marks.—Good rains fell during the past month, thoroughly penetrating the soil, and in consequence ploughing operations have been extensively carried on. There are prospects now of the wheat and forage crops which looked so poor last month, yielding fairly well. The pasturage is in capital condition, and all stock is improving in appearance. Considerable losses of sheep were sustained during the cold weather that accompanied the rain, which, owing to their poor condition they were unable to withstand. No outbreaks of infectious or contagious diseases in large stock have been reported, and there are no quarantined areas. In the lower portion of the district there are some swarms of locusts in the "voetganger" stage, but "preeuw" birds are destroying a great number.

NOTES ON THE WEATHER OF OCTOBER, 1906.

By CHARLES M. STEWART, B.Sc., Secretary to the Meteorological Commission.

An exceptionally heavy rainfall, with unusually low mean temperatures, and late severe frosts causing considerable damage to fruit and young crops, a percentage of cloud slightly higher than usual, but a decrease in the number of fogs as compared with September, a marked increase in the number of thunderstorms, some destructive hail-storms, a fall of snow at the more elevated stations on the 8th, winds stronger than usual, accompanied by a mean pressure about 0.05 ins. higher than the normal, were the most noteworthy features of the weather of October.

Division.	Mean Rainfall (1906).	Mean No. of Days.	Average Rainfall (1891-1900).	Average No. of Days.	Actual Differences from Aver- ages.	Percentage Differences from Aver- ages.
	Inches.		Inches.		Inches.	Per cent.
Cape Peninsula ..	2.31	9	2.78	8	— 0.47	— 17
South-West ..	2.35	7	1.73	6	+ 0.62	+ 36
West Coast ..	0.62	3	0.80	4	— 0.18	— 22
South Coast ..	4.35	12	2.26	8	+ 2.09	+ 92
Southern Karoo ..	2.01	7	0.91	4	„ 1.10	„ 121
West Central Karoo ..	2.13	6	0.62	2	„ 1.51	„ 244
East Central Karoo ..	3.15	8	0.66	3	„ 2.46	„ 373
Northern Karoo ..	1.99	5	0.78	2	„ 1.21	„ 155
Northern Border ..	0.78	2	0.62	2	„ 0.16	„ 26
South-East ..	6.76	12	2.45	8	„ 4.31	„ 176
North-East ..	3.21	9	1.51	4	„ 1.70	„ 112
Kaffraria ..	5.26	13	2.64	8	„ 2.62	„ 99
Basutoland ..	3.36	9	2.34	6	„ 1.02	„ 44
Orange River Colony ..	3.05	11	1.42	3	„ 1.63	„ 115
Durban (Natal) ..	7.33	18	4.46	..	„ 2.87	„ 64
Bechuanaland ..	0.87	3	1.04	4	— 0.17	— 16
Rhodesia ..	3.82	8	0.72	3	+ 3.10	+ 431

Precipitation.—The rainfall during the month amounted on the mean of 332 stations to the unusually large amount of 3.41 ins. falling on 9 days, being 1.51 in, or 79 per cent. above the normal. Compared with the previous month there was a general increase in the amount recorded, although there was an actual deficiency as against the average over the Cape Peninsula, the West Coast and Bechuanaland, of 16 to 22 per cent. Elsewhere, however, the rainfall was considerably above the average, particularly over the Karoo, the North-East, South-East and Rhodesia where it was from two to five times the usual amount. The rains would appear to have set in unusually early over Rhodesia, and to have affected those areas where it was most urgently required. The only divisions having a rainfall of less than one inch (1 inch), were the West Coast, Northern Border and Bechuanaland, the best watered portion being the South-East with an average not far short of seven inches. Summarising the monthly totals it is found that only one station reported Nil; 39 had 1 inch or less; 60 had 1.01 to 2 ins.; 84 had 2.01 to 3 ins.; 48 had 3.01

to 4 ins.; 39 had 4.01 to 5 ins.; 15 had 5.01 to 6 ins.; 24 had 6.01 to 8 ins.; 15 between 8.01 and 10 inches, and 7 more than 10 ins., viz.: Mount Coke, 10.05 ins.; Cwebe, 10.45 ins.; Perie Forest, 10.87 ins.; Grootvader's Bosch, 11.00 ins.; Kentani 11.16 ins.; Thaba N'doda, 11.28 ins.; whilst the maximum amount of 15.24 ins. was recorded at Evelyn Valley. On subjecting the maximum daily falls to a similar scrutiny, it is found that generally speaking, the rains were moderately heavy and continuous, soaking into the ground and well-suited for agricultural purposes. Thus of 323 stations furnishing details, and neglecting the one station with no rainfall, 160 had maxima of 0.01 to 1 in.; 118 had between 1.01 and 2 in.; and 81 between 2.01 and 3 ins.; only 9 having 3.01 to 4 ins., leaving four (4) with maximum daily amounts of more than 4 inches: These were Grootvadersbosch, with 5.15 ins. on the 13th; Swellendam, 4.40 ins., on the 12th; Berlin, 4.30 ins., and Caledon with 4.25 ins., both on the 13th. It may be mentioned that at Thaba N'doda 4 ins. were recorded on the 12th. This heavy rain at Swellendam washed away all small bridges and caused the course of the river to be changed in many places, but no other damage seems to have occurred. The number of *Thunderstorms* reported this month was more than treble that during the previous month, 381 occurring on 23 days. This class of storm was of daily occurrence from the 1st to the 18th, (with the exception of the 5th), and from the 21st to the 26th. They were most wide-spread on the 7th, 12th, 14th, 15th, 17th and 24th, particularly on the 15th. With these were associated some heavy falls of *Hail* which was reported from 57 stations on 13 days, viz.: 1st, 3rd, 7th, 10th to 18th and the 23rd but most numerous on the 15th, 14th, 7th and 12th. *Snow* fell at 17 stations on 5 days, most widely on the 8th, the ground being white on that date at Cheviot Fells, Glen Wallace and Bazeya. *Sleet* occurred at 7 stations on 5 days, principally the 9th.

Temperature Cloud and Wind.—Taken as a whole the month was exceptionally cool, the mean temperature (59.0°) being 4.2° lower than the average and only 0.4° warmer than the usual September temperature. This was the coldest October during the last four years. 1903 being next with a temperature of 59.6°. The deficit in mean temperature was unequally distributed between the days and nights, the mean maximum (69.8°) being 5.8° and the mean minimum (48.2°) being 2.6° cooler than usual. Consequently the mean daily range (21.6°) was 3.2° less than the average amount. Speaking generally, the mean temperature was below the average by 0.5° to 1 degree over the Cape Peninsula, by 1 to 2 degrees in the West and along the South Coast, and East Coasts, and by 2.5 to 4 degrees inland. The only exception to this general deficiency in mean temperature was Port Nolloth where there was an excess of one degree above the average. The deficits were greatest in Basutoland and least over the South-Western Division. The day temperatures were above the average at Port Nolloth and in the Groot Drakenstein District by an amount of 3.7° and 0.6° respectively but were considerably lower than usual elsewhere. The deficiencies were mostly slightly over half a degree in the Cape Peninsula and portions of the South and South-West, 1 to 2 degrees along the South-East and Eastern Coasts, 2 to 3 degrees along the South Coast over some portions of the interior but mostly between 3 and 6 degrees at the inland stations. The night temperatures were generally below the average by 0.5 to 1 degree in the West, South-West, parts of the South East and Kaffraria; by 1.5° to 2° along the coasts and over the High Veld but increasing to between 2 and 3 degrees at Queenstown, Kokstad, the Basutoland stations and Hope Fountain in Rhodesia. Owing to the absence of bright, sunny days the seed fruits appear to be unusually backward, apple-trees being reported as still dormant at Sunnyside, near Grahamstown; whilst the grass on the veld at Kokstad was still very short at the end of the month. The mean warmest station was Hope Fountain with 67.8°, Kimberley coming next with 65.1°, while the coolest station was Disa Head with 50.2° a difference of 11.9°. The highest mean maximum was 81.1° at Hope Fountain and the lowest mean minimum 37.7° at Bensonvale. The warmest period of the month was most commonly from 27th to 31st although maxima were recorded on 4th, 7th, 19th to 21st, 24th and 25. The coldest periods were 1st, 3rd to 5th, 9th to 12th, 19th and 23rd to 27th more particularly the last when temperatures below freezing point were of common occurrence. The mean value of the absolute maxima was 87.5° and of the corresponding minima, 38.3°,—which numbers are only 5.7° and 2.4° respectively above those for September. There was therefore a mean monthly range of 49.2° contrasted with 45.9 in September. The highest temperature of the month was 100.1° recorded at O'okiep on the 31st and the lowest 24.0° on the 25th at Bensonvale, an extreme monthly range of 76.1°. *Frosts* were reported from altogether 35 stations on 12 days, mostly over the interior of the Eastern half of the Colony northwards from Grahamstown, these were most common and most intense on the 25th and 26th, on the latter date 9° of frost were registered at Carnarvon Farm, killing potatoes, beans, mealies,

a large proportion of fruit and even the hardy "bracken" at Fort Fordyce. This phenomenon also occurred on the 1st, 2nd, 4th, 5th, 8th to 11th, 23rd and 27th.

The high mean pressure of the month (0.05 inches above the average) was accompanied by a high percentage of *Cloud* (45 per cent.), which was 3 per cent. more than usual, but 1 per cent. less than during the previous month. The proportion of sky obscured was fairly uniform, ranging from 24 per cent. at Kenhardt to 67 per cent. at Cape Agulhas; it was commonly between 40 and 50 per cent. over the interior, but about 60 per cent. along the South and South-East Coasts. *Fogs* and *Mists* were not so common as in September, being reported from only 108 stations on 28 days, most numerous from 7th to 9th, 11th to 17th, and on the 30th and 31st, particularly the 30th. The only days on which these were not noted were the 2nd, 27th, and 28th.

The mean *Wind-force* during the month was 2.05 on the Beaufort Scale, corresponding to a mean velocity of 13.25 miles per hour. The month was unusually windy, particularly from the 6th to the 14th, when a strong Southerly to South-Easterly gale prevailed over the Cape Peninsula and the South-Western Division, completely ruining from 7,000 to 8,000 vines in the Drakenstein district for this season. Although the prevailing wind was Southerly over the Cape Peninsula, there was a marked increase of winds between S.E. and S.S.W., with an absence of Westerly breezes. The prevailing morning winds were South-Easterly or South-Westerly over the West Coast, West to South-West along the South and East Coast and some distance inland, and South-Easterly in the interior, except at Kimberley, where it was North-Easterly, and O'okiep, where it was East. The wind attained the force of a *Gale* at 15 stations on 12 days, viz., 2nd, 6th to 15th and 25th. The only *Hot Wind* reported was from Stutterheim on the 29th. *Duststorms* occurred at O'okiep on the 2nd, and at Lyndene and O'okiep on the 7th.

An *Earthquake* shock was noted at Kokstad at 9.18 p.m. on the 15th.

OBSERVERS' NOTES.

THE TOWERS.—Very dry. Crops suffering severely from drought.

SWELLENDAM.—The heavy rain on the 12th (4.40 inches) washed away all small bridges and course of river changed in many places.

RICHMOND.—Rainfall for month, 3.50 inches on six days. Much more rain in some parts of the district. No losses of stock reported.

THEEFONTEIN.—Frosts on the 1st, 2nd and 26th, the latter damaging young potatoes, but not fruit. Last four days of month very hot.

THE MEADOWS (SCHOOMBIE).—Rain came in good time. Heavy frosts have occurred, causing damage to crops.

VOSBURG.—Veld generally in good condition, and harvest promising. Quite new young bushes growing everywhere.

WAYERLEY.—Sharp frosts on 25th and 26th killed fruit crops.

FORT FORDYCE.—The frost on evening of 25th killed potatoes, beans etc., and even weeds, Vaal Bushes and Bracken.

GLENCAIRN.—Severe frost on 26th doing enormous damage to fruit crop. Ice as thick as a sixpence on water.

SUNNYSIDE (ALBANY).—Crops a bit knocked about with heavy winds. Bad spring for trees, no warm weather as yet. Apple trees still dormant.

CARNARVON FARM.—This has been the best and the worst October (though seemingly paradoxical) that we have had for ten years. The rainfall for the month (2.63 inches) was only approached in 1901, with 2.37 inches. Frosts in 1903 we had 9, now 8; but on the morning of the 26th we registered nine degrees, which killed all fruit, potatoes, mealies, etc., etc. It is the most deadly and disastrous frost we have had for many years. Little, if any, wind—eight windy days, as against 21, 16 and 12 in 1902, 1903 and 1904. The veld is in A1 condition. All dams full and fountains strong. Stock fast recovering themselves. Locusts in several parts of Queenstown district are now hatching. Wheat, oats and barley that were in ear or in pipe, are killed outright. Poor South African farmer! His bed is a bed of roses, with thorns like the quills of a porcupine.

LADY FRERE.—Frost on 26th and 27th—most unusual so late in the season. Last frost generally about 9th September. Scarcely any apricots to be had in consequence, and grapes and other fruit also affected.

RHODES.—The frost on the 25th either nipped or killed all fruit and vegetables, even young grass.

THIBET PARK.—Splendid soaking rains during the month, the best for a very long time.

WHITTLESEA.—Heavy frost on 25th. Killed potatoes and beans.

KOKSTAD.—Heavy frost on the morning of 26th, damaging vegetable gardens and fruit. Intense heat from the 29th. Country looking green, but more rain wanted.

GROOT DRAKENSTEIN.—Temperature 0.2° below average 7 years.

Rainfall 1.73 inches below average 13 years (3.34) or 48 per cent. of average.

Rainfall, total deficiency to date 11.82 inches, or about one-third of average (13 years) 34.66 inches.

The terrible S.E. gale which raged from 6th to 14th played fearful havoc in this and surrounding districts with vineyards, etc. On this farm from 7,000 to 8,000 vines were entirely ruined for this season. The heavy rain on the night of the 24th (1.12 inches)—the second heaviest fall this year—did a vast amount of good, though it was too late to be of much benefit to the oat crop.

KOKSTAD.—Much needed rains fell this month, the fall being considerably over the average for October. One or two farms had severe hailstorms, and suffered considerable damage. The usual late frost occurred on the 26th, and damaged the potato, tomato, and other crops. Fruit being backward will, it is feared, suffer from the same cause. The veld is green, but very short, the absence of warm sunlight retarding its growth. Cattle and sheep are still low in condition. There was a slight shock of earthquake on the night of the 15th.

QUEENSTOWN.—Vines, French beans and mulberry leaves a little scorched by frost on the 26th.

TEMPERATURE, OCTOBER, 1906.

Stations.	Mean Max.	Mean Min.	Monthly Mean.	Abs. Max.	Date.	Abs. Min.	Date.
Royal Observatory ..	68.1	52.0	60.0	87.5	31	42.3	24
Sea Point ..	66.9	51.7	59.3	79.0	28	45.0	26
Simon's Town ..	68.5	54.2	61.4	86.0	31	49.2	4 & 24
Cape Town (S.A. College) ..	69.4	51.4	60.4	88.5	31	44.0	24
Table Mountain (Disa Head) ..	57.9	42.5	50.2	83.0	31	23.0	11
Devil's Peak ..	63.4	45.9	54.7	84.0	31	38.0	9
Wynberg ..	68.2	51.1	59.7	84.0	31	42.5	23
Wellington ..	72.8	52.9	62.8	94.6	30	42.0	4
Groot Drakenstein ..	72.2	49.8	61.0	95.6	31	38.4	24
Ceres ..	75.2	46.4	60.8	80.0	4 & 31	36.0	23
Eisenburg Ag. College ..	70.6	47.2	58.9	90.7	31	38.8	23
Robertson (Govt. Plantation) ..	73.1	48.4	60.7	90.0	31	36.5	1
Port Nolloth ..	69.9	47.8	58.9	91.0	7	39.0	9
O'okiep ..	72.4	48.1	60.2	100.1	31	38.0	9
Cape St. Francis ..	64.9	54.0	59.5	72.0	24	42.0	10
Storm's River ..	66.3	49.8	58.0	88.0	27	42.5	9
George (Plantation) ..	65.8	49.3	57.6	94.0	31	42.0	27
Cape L'Agulhas ..	64.0	53.1	58.5	74.0	27	46.0	23
Heidelberg ..	72.8	49.7	61.2	93.0	31	43.0	12
Port Elizabeth ..	66.4	54.5	60.4	72.0	19, 28 & 29	48.0	9 & 10
Amalienstein ..	73.2	47.2	60.2	91.0	28	36.0	1
Hanover ..	71.3	41.6	56.4	90.0	31	28.0	26
Murraysburg ..	70.4	43.8	57.1	93.0	29	31.0	25
Kimberley ..	80.2	50.0	65.1	98.2	31	37.9	1
Cathcart ..	67.0	43.9	56.0	88.8	29	31.9	9
Stutterheim ..	67.9	49.1	58.0	89.0	30	39.0	9
King William's Town ..	72.0	49.5	60.8	88.0	27	41.0	9
East London ..	68.3	55.2	61.8	74.0	20, 21 & 29	49.0	1, 9, 10 & 27
Sydney's Hope ..	66.2	48.8	57.5	81.5	27	40.5	10
Evelyn Valley ..	63.0	44.1	53.5	84.0	28 & 29	33.0	9
Aliwal North ..	72.1	44.4	58.2	88.0	29	34.5	4 & 26
Rietfontein (Aliwal North) ..	68.5	43.6	56.0	86.1	29	33.5	26
Queenstown ..	72.4	45.3	58.8	96.0	29	31.0	26
Bensonvale Institute ..	70.0	37.7	53.8	88.0	30	24.0	25
Port St. John's ..	71.6	57.0	64.3	79.0	29	46.0	4
Main ..	68.4	47.4	57.9	94.8	29	36.2	4
Umtata ..	71.2	49.1	60.2	96.0	29	37.0	5
Tabankulu ..	68.6	47.3	57.9	91.8	29	35.5	26
Kokstad (The Willows) ..	69.5	43.9	56.7	90.2	29	32.0	26
Mohalie's Hoek ..	69.7	42.3	56.0	87.0	31	30.0	4 & 26
Teyateyaneng ..	71.6	42.7	57.2	84.0	31	30.0	5
Leribe ..	69.6	46.1	57.8	85.0	30	33.8	3
Kuruman ..	79.0	47.6	63.3	96.0	31	33.0	1, 9 & 19 25
Hope Fountain ..	81.1	51.6	67.8	93.8	25	47.5	25
Means ..	69.8	48.2	59.0	87.5	..	38.3	..
Extremes ..	..	..	..	100.1	31	24.0	25

RAINFALL, OCTOBER, 1906.

I. CAPE PENINSULA :		INCHES.	III. WEST COAST :— <i>continued</i>		INCHES
Royal Observatory (a) 12 inch	gauge	1.29	Klipfontein	..	0.39
Cape Town, Fire Station	..	1.32	Kraaifontein	..	0.38
Do South African College	..	2.07	O'okiep	..	0.65
Do Molteno Reservoir	..	2.14	Springbokfontein	..	0.22
Do Platteklip	..	2.76	Van Rhynsdorp	..	0.25
Do Signal Hill	..	1.27	Clanwilliam (Gaol)	..	0.51
Do Sea Point (Hall)	..	1.36	Dassen Island	..	0.50
Do do. (Attridge)	..	1.44	Kersefontein	..	0.28
Camp's Bay	..	2.13	The Towers	..	0.54
Table Mountain, Disa Head	..	3.58	Malmesbury	..	1.15
Do Kasteel's Poort	..	4.32	Piquetberg	..	1.36
Do Waai Kopje	..	3.12	Zoutpan	..	0.33
Do St. Michael's	..	4.63	Wupperthal	..	0.19
Devil's Peak, Block House	..	1.84			
Do. Nursery	..	2.00	IV. SOUTH-COAST :		
Do. Lower Gauge	..	1.99	Cape L'Agulhas	..	1.83
Woodstock (Hall)	..	1.53	Bredasdorp	..	4.06
Do (Municipal Quarry)	..	1.99	Swellendam	..	7.82
Do (with Nipher's Shield)	..	2.15	Zuurbraak	..	6.73
Newlands (Montebello)	..	2.52	Grootvaders Bosch	..	11.00
Claremont (Carrigeen)	..	2.20	Heidelberg	..	3.63
Bishops court	..	2.95	Riversdale	..	4.20
Kenilworth	..	2.25	Vogel Vlei	..	3.99
Wynberg (St. Mary's)	..	2.40	Mossel Bay	..	3.29
Groot Constantia	..	3.35	Great Brak River	..	3.35
Tokai Plantation	..	2.51	George	..	4.11
Plumstead (Culmwood)	..	2.26	Do (Plantation)	..	4.30
Muizenberg (Storage Res.)	..	4.44	Woodfield (George)	..	4.27
Simon's Town (Wood)	..	3.29	Concordia	..	5.15
Do. (Gaol)	..	2.94	Knysna	..	2.75
Cape Point	..	0.55	Plettenberg Bay	..	4.42
Robben Island	..	0.57	Harkerville	..	6.74
Maitland Cemetery	..	1.14	Blaauwkrantz	..	7.67
Tamboer's Kloof (Monte Vista)	..	1.84	Lottering	..	5.44
Newlands Reservoir (No. 1) (450)	..	2.62	Storm's River	..	5.05
Do (No. 2) (450)	..	2.59	Witte Els Bosch	..	5.95
Woodhead Tunnel (Tbl. Mount.)	..	1.44	Cape St. Francis	..	4.43
			Kruis River	..	2.33
II. SOUTH-WEST :			Uitenhage (Gaol)	..	2.16
Klapmuts	..	1.50	Do (Park)	..	1.98
Stellenbosch (Gaol)	..	1.57	Armadales (Blue Cliff)	..	2.97
Somerset West	..	1.45	Port Elizabeth (Harbour)	..	2.78
Paarl	..	1.60	Do. (Walmer Heights)	..	5.64
Wellington (Gaol)	..	1.47	Shark's River (Nursery)	..	4.30
Groot Drakenstein (Weltevreden)	..	1.61	Do (Convict Station)	..	3.50
Tulbagh	..	0.99	Tankatara	..	1.92
Ceres	..	2.23	Centlivres	..	1.41
Rawsonville	..	2.19			
Caledon	..	6.32	V. SOUTHERN KAROO :		
Worcester (Gaol)	..	2.48	Ladismith	..	1.72
Hex River	..	0.77	Amalienstein	..	3.07
Robertson (Gaol)	..	2.03	Calitzdorp	..	1.35
Do (Govt. Plantation)	..	1.88	Uniondale	..	0.75
Danger Point	..	2.89	Kleinpoort	..	2.59
Vijgebooms Rivier	..	5.51	Glenconnor	..	2.56
Eisenberg Agricultural College	..	1.28			
Roskeen	..	4.88			
Vruchtbaar	..	2.89			
III. WEST COAST :			VI. WEST CENTRAL KAROO :		
Port Nolloth	..	0.06	Fraserburg Road	..	1.40
Anenous	..	0.52	Prince Albert	..	1.13
			Zwaartburg Pass	..	7.82

VI. W. C. KAROO :— <i>continued</i>		INCHES	VIII. N. KAROO :— <i>continued</i>		INCHES
Beaufort West (Gaol)	..	2.24	Craddock (Gaol)	..	2.88
Dunedin	..	1.00	Maraisburg	..	1.96
Camfer's Kraal	..	1.17	Steynsburg (Gaol)	..	2.16
Baaken's Rug	..	1.35	Riet Vlei	..	2.13
Willowmore	..	1.37	Quagga's Kerk	..	2.30
Steytlerville	..	1.62	Tarkastad	..	2.32
VII. EAST CENTRAL KAROO :			Waverley	..	2.85
Buffels Kloof	..	5.63	Schuilhoek	..	1.74
Aberdeen (Gaol)	..	4.10	Vosburg	..	3.77
Corndale	..	5.51	Zwavelfontein	..	0.87
Klipplaat	..	1.53	The Meadows (Schoombie)	..	1.83
Winterhoek	..	4.29	Craddock	..	2.59
Klipdrift	..	2.60	Rietfontein	..	1.17
Kendrew	..	3.21	IX. NORTHERN BORDER :		
Graaff-Reinet (Gaol)	..	2.96	The Halt	..	0.00
Do (Eng. Yard)	..	2.95	Kenhardt	..	0.16
New Bethesda	..	1.86	Upington	..	0.06
Rodebloem	..	2.07	Trooillapspan	..	0.14
Glen Harry	..	2.22	Van Wyk's Vlei	..	0.05
Jansenville	..	2.47	Prieska	..	0.05
Patrysfontein	..	1.99	New Year's Kraal	..	0.15
Toegedacht	..	2.17	Dunmurry	..	0.78
Klipfontein	..	2.79	Karree Kloof	..	0.95
Cranemere	..	3.01	Griqua Town	..	1.43
Pearston	..	3.06	Campbell	..	1.47
Darlington	..	1.71	Orange River	..	0.76
Somerset East (Gaol)	..	6.50	Newlands (Barkly West)	..	1.92
Middleton	..	3.48	Barkly West	..	0.32
Spitzkop (Graaff-Reinet)	..	2.89	Kimberley (Gaol)	..	2.19
Bruintjes Hoogte	..	3.49	Do (Stephens)	..	2.51
VIII. NORTHERN KAROO :			Strydenburg	..	0.36
Calvinia	..	0.25	X. SOUTH-EAST :		
Sutherland	..	0.41	Melrose (Div. Bedford)	..	3.70
Fraserburg	..	1.24	Dagga Boer	..	4.50
Carnarvon	..	1.42	Cheviot Fells	..	2.51
Brakfontein	..	2.26	Bedford (Gaol)	..	5.34
Victoria West	..	0.94	Sydney's Hope	..	3.28
Doorskuilen	..	0.11	Cullendale	..	5.98
Britstown	..	0.67	Adelaide	..	5.59
Wilbebestkooij	..	1.64	Atherstone	..	4.20
Murraysburg	..	1.10	Alexandria	..	2.89
De Kruis (Murraysburg)	..	1.55	Salem	..	3.09
Richmond	..	3.50	Fort Fordyce	..	6.80
Hanover	..	1.28	Heathertou Towers	..	4.29
Theefontein	..	1.33	Sunnyside	..	5.33
Petrusville	..	1.18	Fort Beaufort	..	6.80
The Willows (Middelburg)	..	1.96	Katberg	..	8.55
Middelburg (Gaol)	..	3.47	Balfour	..	9.00
Do	..	2.33	Glencairn	..	4.89
Jackalsfontein	..	2.96	Port Alfred	..	4.42
Ezelpoort	..	2.73	Hogsback	..	9.02
Plaatberg	..	2.72	Peddie	..	4.47
Grape Vale	..	3.01	Exwell Park	..	3.46
Ezelsfontein	..	2.86	Keiskama Hoek	..	7.37
Rodepoort	..	2.89	Cathcart (Gaol)	..	4.41
Groenkloof	..	2.76	Cathcart (Forman)	..	4.53
Vlakfontein	..	2.92	Thaba N'doda	..	11.23
Vogelsfontein	..	2.61	Evelyn Valley	..	15.24
Plaatfontein	..	2.82	Perie Forest	..	10.87
Colesberg	..	1.54	Isidenge	..	8.98
Fish River	..	1.92	Kologha	..	8.17
Varken's Kop	..	2.74	King William's Town (Gaol)	..	7.80
Droogefontein	..	2.00	Do (Dr. Egan)	..	8.58

X. SOUTH-EAST—*continued*

INCHES

Stutterheim (Besté)	..	6.86
Fort Cunynghame	..	6.72
Kubusie	..	6.30
Quacu ..	..	5.52
Bolo ..	..	8.23
Fort Jackson	..	7.20
Prospect Farm (Komgha)	..	7.67
Komgha (Gaol)	..	9.84
Chiselhurst	..	8.87
East London, West	..	7.35
Cata ..	..	7.18
Wolf Ridge	..	9.24
Dontsah	..	9.74
Mount Coke	..	10.05
Blackwoods	..	8.88
Albert Vale (near Bedford)	..	4.52

XI. NORTH-EAST :

Venterstad	..	2.31
Ellesmere	..	2.19
Molteno	..	2.56
Lyndene	..	2.34
Thibet Park	..	2.05
Sterkstroom (Station)	..	2.77
Do (Gaol)	..	2.68
Rocklands	..	3.16
Aliwal North (Gaol)	..	3.58
Do (Brown)	..	3.78
Buffelsfontein	..	2.63
Carnarvon Farm	..	2.63
Halseton	..	3.85
Jamestown	..	3.72
Whittlesea	..	3.75
Queenstown (Gaol)	..	3.50
Rietfontein (Aliwal North)	..	4.43
Middlecourt	..	2.85
Dordrecht	..	3.54
Herschel	..	4.24
Lady Grey	..	3.66
Lauriston	..	3.96
Lady Frere	..	3.93
Contest (near Bolotwa)	..	4.38
Sterkspruit	..	2.71
Keilands	..	3.91
Barkly East	..	2.24
Blikana	..	3.11
Albert Junction	..	2.63
Queenstown (Dist. Eng's Office)	..	3.85
Hughenden	..	1.57
Glenwallace	..	2.74
Indwe (Dis. E's Office)	..	3.06
Bensonvale Inst. (Herschel)	..	3.43

XI. NORTH-EAST: *Continued*

INCHES

Cathcart (Queenstown)	..	4.80
Royal (Div. Albert)	..	2.89

XII. KAFFRARIA :

Ida (Xalanga)	..	5.06
Cofimvaba	..	5.39
Tsomo	..	6.48
N'qamakwe	..	4.66
Main	..	4.38
Engcobo	..	6.63
Butterworth	..	3.49
Kentani	..	11.16
Maclear	..	4.91
Bazeya	..	7.77
Willowvale	..	9.01
Mount Fletcher	..	3.21
Somerville (Tsolo)	..	2.93
Elliotdale	..	4.68
Mqanduli	..	4.55
Umtata	..	4.86
Owebe	..	10.45
Tabankulu	..	3.07
Kokstad	..	2.66
Do (The Willows)	..	2.58
Flagstaff	..	2.99
Insikeni	..	4.14
Port St. John's	..	7.75
Kilrush (Sneezeewood)	..	3.37
Elliot	..	3.87

XIII. BASUTOLAND :

Mohalie's Hoek	..	2.99
Maseru	..	3.32
Teyateyaneng (Berea)	..	3.02
Leribe	..	2.96
Butha Buthe	..	4.53

XV. NATAL :

Durban, Observatory	..	7.33
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XVII. BECHUANALAND :

Taungs	..	1.24
Vryburg	..	0.59
Setlagoli	..	1.46
Kuruman	..	0.19

XVIII. RHODESIA :

Hope Fountain	..	4.18
Rhodes' Matopo Park	..	3.47

CURRENT MARKET RATES OF AGRICULTURAL PRODUCE.

The following Table of Current Market Rates (Wholesale) of Agricultural Produce on Saturday, the 24th November 1906, ruling at the several centres named, is published for general information:—

CENTRE.	A Wheat per 100 lb.	B. Wheat flour per 100 lb.	C. Boer Meal per 100 lb.	D. Mealies per 100 lb.	E. Mealie Meal per 100 lb.	F. Barley per 100 lb.	G. Oats per 100 lb.	H. Oat-hay per 100 lb.	J. Potatoes per 100 lbs.	K Tobacco (Boer Roll) per lb.	L Beef per lb.	M. Mutton per lb.	N. Fresh Buttler per lb.	O. Eggs per doz.	P. Cattle (Slaughter) £10 £15 £20 £10	Q. Sheep (Slaughter) 21/- to 24/- 23/6 25/- 27/- 36/6 18/- 18/- to 22/- 21/- 4s. 6d. £1 5s. 20/- to 29/- 20/- 18/- 22/- to 25/-
Altwal North	£ s. d. 0 13 0	£ s. d. 0 13 0	£ s. d. 0 14 0	£ s. d. 0 7 6	£ s. d. 0 6 6	£ s. d. 10 0	£ s. d. 0 8 0	£ s. d. 0 8 0	£ s. d. 10 0	£ s. d. 1/- to 2/-	£ s. d. 54d to 7d	£ s. d. 54d to 8d	£ s. d. 0 0 9	£ s. d. 1 0 1	£ s. d. 29 to £10	21/- to 24/- 23/6
Beaufort West	0 13 0	0 16 6	0 13 6	0 9 6	0 13 6	10 0	0 6 0	0 6 0	0 10 0	0 0 9	54d to 1s	54d to 7d	0 1 6	1 0 3	£15	25/-
Burgersdorp	0 9 6	0 7 0	0 10 3	0 8 6	0 9 0	7 6	0 6 0	0 6 0	0 6 6	1/4 to 1/8	8d, 9d, 10d to 1/4	8d, 9d, 10d to 1/4	0 1 0	1 0 1	£16 to £20	25/-
Cape Town	0 9 6	0 7 0	0 10 3	0 8 6	0 9 0	7 6	0 6 0	0 6 0	0 6 6	0 1 0	7d to 8d	7d to 8d	0 1 3	1 0 1	£10	27/-
Olaniwilliam	11/- to 14/-	...	12/- to 13/-	0 9 0	...	9 0	...	...	5/- to 6/-	0 1 0	...	...	0 1 3	1 0 1	£10	18/-
Oradeburg	0 9 0	0 13 0	0 12 0	0 7 6	0 9 0	4 10	0 6 3	0 4 3	0 19 9	0 0 6	0 8 0	0 8 0	0 0 8	1 0 1	£10	27/-
Dordrecht	0 8 6	0 11 3	0 10 9	0 6 9	0 8 9	6 3	0 6 3	0 6 0	0 7 0	0 1 6	1/4d & 3/4d	1/4d & 3/4d	0 0 8	1 0 1	£10	36/6
East London	0 10 0	0 10 0	0 11 6	0 6 6	0 6 6	5 6	0 6 3	0 6 0	0 10 0	0 0 5	...	...	0 0 8	1 0 1	£10	18/-
Graaf-Reinet	0 10 0	0 10 0	0 11 6	0 6 6	0 6 6	5 6	0 6 3	0 6 0	0 10 0	0 0 5	...	...	0 0 8	1 0 1	£10	18/-
Graham's Town	0 11 0	0 15 0	0 13 0	0 7 6	0 8 0	8 0	0 9 0	0 0 0	0 14 6	0 0 7	0 1 0	0 8 0	0 1 6	1 0 1	£14 to £17	18/- to 22/-
Kimberley	0 7 0	0 14 0	0 12 0	0 6 6	0 8 0	6 0	0 8 0	0 2 6	0 16 0	0 0 4	0 5 2	0 6 4	0 0 10 1/2	1 0 3	£20 to £25, 6d.	£1 5s.
King Wm's Town	0 9 0	0 11 6	0 10 6	0 11 0	...	8 0	0 8 0	0 4 0	0 20 0	0 1 0	0 8 0	0 7 0	0 1 3	1 0 1	£15 10s	...
Malmesbury	0 9 0	0 11 6	0 10 6	0 11 0	...	8 0	0 8 0	0 4 0	0 20 0	0 1 0	0 8 0	0 7 0	0 1 3	1 0 1	£15 10s	...
Mossel Bay	0 10 0	0 15 0	0 13 0	0 18 0	0 10 0	4 0	0 8 0	0 6 0	0 13 0	0 1 0	0 9 0	0 9 0	0 1 6	1 0 1	£15 10s	...
Port Alfred	0 10 0	0 15 0	0 13 0	0 18 0	0 10 0	4 0	0 8 0	0 6 0	0 13 0	0 1 0	0 9 0	0 9 0	0 1 6	1 0 1	£15 10s	...
Port Elizabeth	0 10 0	0 15 0	0 13 0	0 18 0	0 10 0	4 0	0 8 0	0 6 0	0 13 0	0 1 0	0 9 0	0 9 0	0 1 6	1 0 1	£15 10s	...
Queen's Town	0 6 0	0 11 3	0 6 6	0 6 0	0 7 9	4 6	7 6	0 5 6	0 7 6	0 1 0	0 6 0	0 7 0	0 1 3	1 0 1	£13 to £15	20/- to 29/-
Tarkasbad	0 11 0	0 14 0	0 13 0	0 8 0	0 11 0	6 0	0 6 0	0 6 0	0 7 6	0 1 3	0 10	0 9 0	0 1 6	1 0 1	£13	20/-
Vryburg	0 11 6	0 18 0	0 14 3	0 8 0	0 9 9	8 0	11	0 8 6	0 6 9	0 0 6	0 10	0 9 0	0 1 6	1 0 1	£12	18/-
Worcester	0 9 0	0 14 0	0 10 6	0 8 0	0 9 0	7	8	0 4 0	0 6 0	0 0 6	0 10	0 9 0	0 1 6	1 0 1	£10 to £15	22/- to 25/-

NOTE.—A blank space denotes "no transactions."

*Colonial.

Imported.

DEPARTMENTAL NOTICES.

The Introduction of Sheep from Natal into Pondoland and East Griqualand.

By Proclamation No. 410, dated October 29, 1906, the introduction of sheep from the Colony of Natal into Pondoland is, from and after the date of promulgation thereof, absolutely prohibited :

And it is further made known that it shall not be lawful to introduce sheep from Natal into East Griqualand unless they shall be accompanied by a certificate, signed by an Inspector of Stock appointed to administer Scab Laws or Regulations in Natal to the effect that such sheep are free from Scab, and have been properly dipped on the date of and immediately prior to introduction under his supervision in an approved arsenical dip at either of the Ports of Entry established on the Border at Standford's Drift or Union Bridge ; provided, further, that such sheep shall have been inspected, BEFORE their introduction, by the Sheep Inspector of the district or area in Griqualand East into or through which such sheep are intended to pass, who shall, if he is satisfied that the sheep are free from Scab, and have been properly dipped as aforesaid in an approved arsenical dip, make an endorsement to that effect on the certificate, and permit the sheep to proceed on their way.

Proclamation No. 374, dated 24th October, 1905, is from the date of promulgation hereof, cancelled and repealed.

Trout Fishing Regulations.

Proclamation No. 340, dated September 24, 1906, is re-published with amendments, including the following Regulations :—

1. It shall be lawful to fish for trout in the Berg, Breede, Eerste, Hex, Lourens, and Palmiet Rivers and River Zonder End, and in any of the tributaries thereof, and in Princess Vlei, Rondevlei and Seacow Vlei, in the Cape Division, between the first day of October in any year and the fifteenth day of January in the following year, both days inclusive ; and in the Buffalo, Izeli, Keiskama, Kabusi, and Wildebeeste or Inxu Rivers, and in the tributaries thereof, between the first day of October in any year and the thirty-first day of March in the following year, both days inclusive : provided the following conditions be observed, namely :—

- (a) That no person shall fish for, capture, pursue, or destroy trout of any variety, without having first registered his name with, and obtained a permit from, the Resident Magistrate of any of the following Districts, viz.: Cape Town, Paarl, Stellenbosch, Caledon, Wellington, Tulbagh, Piquetberg, Worcester, Port Elizabeth, East London, King William's Town, Grahamstown, and Maclear.
- (b) That fishing shall be with rod and line only, and that artificial fly only be used as a lure ; no phantom or other minnows or spoons, no dead or live baits, and no nets or other mode of capture allowed, but this shall not be held to exclude the use of a legitimate landing net or gaff for landing the fish caught.
- (c) That if any trout less than 12 inches in length be caught, it shall be forthwith returned to the water from which it was taken with as little delay and as little injury as possible, and that the number of trout of 12 inches in length and over which may be caught by any one person in one day shall not exceed 6.
- (d) That the consent of the owner on whose ground it is proposed to fish be first obtained.
- (e) That the permit issued be produced for inspection when demanded by any member of the Police Force, Forest Ranger or Officer, or other Government Official, or by the owner of the property on which the holder of the permit is fishing.
- (f) That the permit be not transferable.

2. Riparian owners shall not require to obtain a permit to fish for trout in the open waters on their own property during the Fishing Season, but such fishing shall be subject to the conditions mentioned in Regulation No. 1 of this Schedule.

3. Any person or persons contravening any of the foregoing Regulations or any of the conditions thereof, shall be liable, on conviction, to a fine not exceeding twenty pounds sterling (£20) for each offence, and in default of payment thereof, to imprisonment, with or without hard labour, for a period not exceeding three months.

African Coast Fever.

H.E. the Governor has issued the following proclamation (No. 416, dated Nov. 5, 1906):—

Whereas by my Proclamation No. 312, bearing date the 8th day of September, 1906, I did prohibit the introduction into this Colony of any cattle, animal produce or grass-hay from the Colony of Natal by reason of the existence of the disease amongst cattle, known as African Coast Fever, in certain portions of that Colony:

And whereas, owing to the spread of the said disease, it has been shewn to me to be expedient to repeal the Proclamation aforesaid and to make further provisions in lieu thereof:

Now, therefore, under and by virtue of the powers vested in me by the provisions of Acts No. 9 of 1876 and 27 of 1893, and Clause 4 of the Regulations published by Proclamation No. 116, bearing date the 20th day of April, 1906, I do hereby proclaim, declare and make known that, whereas the disease known as African Coast Fever exists among cattle in the Colony of Natal, it shall not be lawful, from after the date of promulgation hereof, and until this Proclamation be otherwise amended or repealed, to introduce or cause or allow any Cattle, animal produce or grass-hay to be introduced from the said Colony of Natal into this Colony, including the Territories of the Transkei, Tembuland, East Griqualand and Pondoland.

And I do hereby proclaim, and make known that any person who shall introduce or cause or allow such cattle, animal produce or grass-hay to be introduced, or permit such cattle to stray into this Colony, or any of the Territories aforesaid, from Natal shall be deemed guilty of contravening the provisions of this Proclamation, and shall be liable to the penalties provided for such contravention by the said Acts No. 9 of 1876 and 27 of 1893 and Proclamation No. 116 of 1906, respectively; and that all such cattle, animal produce or grass-hay as may enter this Colony or the said Territories from Natal in contravention of this Proclamation shall be liable to be destroyed.

And I do strictly charge every Resident Magistrate, Field-cornet, Justice of the Peace and Inspector of Native Locations to see that this Proclamation is obeyed, and to bring to justice any person who may contravene the same.

Proclamation No. 312, dated the 8th September, 1906, is hereby cancelled and repealed.

Noxious Weeds.

Under Proclamation No. 420, dated November 5, 1906, the noxious plant called "Aplopappus Weed," locally known as "Khaki Bosch," is to be dealt with by the Divisional Council of the district of Tulbagh in manner similar to that provided by the Act in the case of the Burrweed called *Xanthium spinosum*, and thereupon all the provisions of Sub-division VI., Part I., of the said Act, as amended by Act No. 18 of 1898, relating to Burrweed called *Xanthium spinosum*, are to apply in respect of such noxious plant.

Applications for Agricultural Employment.

Louis A. Lauder, 2, Rowlands Cottages, Klipper Road, Newlands, Cape.—Employment wanted in dairying or general farm work. Understands treatment of cattle and horses, also of livestock generally, together with land cultivation. References good. Age 41. Married; two children.

J. G. D. Rex, Barroa Station, Steytlerville:—Age 59. Married. One child. Twenty years experience in Sheep and Goat farming. Understands livestock generally. Desires management of Farm or Dairy, or other farm work. Wife understands management of poultry.

Wanted position on a good stock farm as assistant or under-manager; applicant has had year-and-a-half's experience on Eastern Province stock farm, would be satisfied with board and small salary, or grazing for stock. Satisfactory testimonials, age 26, unmarried.—Reply to C. D. P.O. Box 61, Grahamstown.

DEPARTMENTAL PUBLICATIONS.

The following pamphlets, reprints, &c. are obtainable on application to the Editor of the *Agricultural Journal*, Department of Agriculture, Cape Town. Members of Farmers' and Fruit Growers' Associations applying for same through the Secretaries of these Associations are supplied free of charge.

Agricultural Miscellanea, price 6d. each. Extracts from Vols. I. to V of *Agricultural Journal*.

Artificial Grasses and Fodder for Stock; Ensilage; Treatment of Cereal and other Crops; Viticulture and Wine Making; Forestry; Locusts and their Destruction; Possible New Industries for Cape Farmers; Stock Farming; Dairying; Fruit Culture (6d.)

Agriculture.

Wheat Production in Australia (1s. 6d.) by A. C. Macdonald; *Wheat Production in Australia (1s. 6d.) by W. Halse and J. D. J. Visser; Hop Cultivation (3d.) translated by A. W. Heywood; *Brak Land in Relation to Irrigation and Drainage (1d.); The Velvet Bean (1d.); Potato Disease (1d.); Scheme of Manurial Experiments (1d.); Leguminous Forage Crops for Trial in Cape Colony (1d.); Sundry Forage Crops for trial in Cape Colony (1d.); Poultry in South Africa: Rearing Management and Improvement, with notes on Prevalent Diseases and Internal and External Parasites (3d.); The Salt Bushes (1d.); Tobacco Culture by P. Bornemisza (1d.); The Cultivation of Tobacco in the Colony by K. Schenck (3d.); Tobacco Wilt in Kat River Valley (1d.); *The Process and Appliances for the Flue Curing of Tobacco. (3d.)

Dairying.

Dairy Breeds by A. C. Macdonald (9d.); *Dairy Industry in Great Britain by A. C. Macdonald (6d.); *Dairy Industry in Denmark (2d.); Ready Reckoner for Cream Testing (1s.); †Dairy and its products by D. Hutcheon (2d.); *Cheddar Cheese Making (1d.)

Entomology.

The Bont Tick (1d.); Bean Bruchus 1d.; Cabbage Aphis (1d.); Codling Moth in Madeira Fruit (1d.); *Codling Moth (1d.); Fruit Fly (1d.); Fumigation Supplies (1d.); Insect Friends and Foes (1d.); Methods of Locust Destruction (1d.); *Peach Yellows (1d.); Pear Slug, Paris Green (1d.); Remedy for Mezwurmen (1d.); *Spray Calendar (1d.); *Spray Pump Notes (1d.); Scale Insects on Ornamental Trees and Plants (1d.); Two Pine Apple Pests (1d.); Tree Fumigation in California (1d.); Winter Spraying (1d.); Wattle Bag Worm (1d.); Bordeaux Mixture (1d.); Deaths Head Moth Superstition (1d.); Fumigation under Box Covers (1d.); The House Fly (1d.); New Oak Tree Pest (1d.); Nursery Inspection and Quarantine Bill (1d.); Oil Water Pumps (1d.); The Plague of Ticks (1d.); Potato Tuber Moth (1d.); The Codling Moth; Notes on its Life Cycle and Remedies (1d.); Gall Worms in the Roots of Plants (1d.); The Fruit Fly,* (with coloured plates) (3d.); Another Introduced Scale Pest (1d.); Washes for Red Scale (1d.); Fruit Fly: Peach Fly (1d.); Lime-Sulphur-Salt Wash for Scale Insect (1d.); The Fruit Moth (1d.); Fusicladium of the Apple and Pear (1d.); Mealie Stalk Borer (3d.)—*coloured plate*: Cleaning up Nursery (1d.); Natural Enemies of the Fruit Fly: Report on Investigations in Brazil (1d.); Locust Birds and Locust Poison (1d.); The Brazil Fruit Fly Parasites (1d.); Cyanide Gas Remedy for Scale Insects (3d.); Arsenate of Lead (1d.)

Forestry.

British National Forestry (1d.); Botanical Observations on Forests in Eastern Pondoland (1d.); †Elementary Principles of Sylviculture or Woodcraft (1d.); National Forests (1d.); Indigenous Timbers of the Cape (1d.); Misuse of Coal and the Uses of Forests (1d.); Tree Planting for Timber and Fuel (1d.); Tree Planting for Farmers (1d.)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

Fisheries.

Trout and Carp Breeding and Stocking of Streams (1d.); *Methods of Preserving Fish by Smoking (1d.); Portable Floating Hatching Box for Trout Ova (1d.)
The Protection of Trout (1d.); The Ocean and its Resources (1d.)

Horticulture

Fruit Culture in the Gamtoos River Valley (1d.); *Marketing of Fruit (1d.); Manual of Practical Orchard Work at the Cape (6d.); The Olive at the Cape (2d); Tomatoes and Fruit for Export (1d.); Citrus Culture in Cape Colony: Report of the Citrus Commission (1d.); *Fruit from Orchard to Buyer (1d.); Netting for Fruit Trees (1d.); Fruit Culture in Argentina (1d.); Vegetables for Exhibition (1d.) Chrysanthemum Rust (1d.)

Veterinary and Animal Industry.

*Anthrax, Charbon, Miltzbrand or Miltziekte (1d.); *Heartwater (1d.); *Malarial Catarrhal Fever of Sheep (1d.); *Preventive Vaccination against Anthrax and Swine Fever (1d.); Rinderpest: Dr. Koch's Report (1d.); *Inoculation against Rinderpest (1d.); Dr. Kohlstock's Report on Inoculation for Rinderpest (1d.); *Redwater, Texas Fever or Tick Disease (1d.); *Redwater, Anthrax and Quarter Evil (1d.); *Sheep and Wool (1d.); The Eye and its Diseases (1d.); Husk, Hoose or Parasitic Disease of the Lungs of Cattle, Sheep and Pigs (1d.); Tick Heartwater Experiments (1d.); Indigestion and Diarrhoea in Calves (1d.); Persian Sheep and Heartwater (1d.); Poisoning of Stock (1d.); Retention of the Fœtal Membrane, or Afterbirth in Cows (1d.); Stijfziekte, Lamziekte or Osteo-Malacia and Paralysis (1d.); Tuberculosis and the Use of Tuberculin (1d.); African Coast Fever with Description of Dipping Tank (3d.); *Rinderpest in South Africa (3d.) by D. Hutcheon; *Fluke or Slak in Liver of Sheep (3d.)—*coloured plate*; *Anthrax or Miltzziekte and Quarter Evil or Sponsziekte (1d.); Osteo Porosis (3d.)—*coloured plates*; *Glanders (3d.)—*coloured plate*; *Animal Castration (1d.); *Preventive Inoculation for Redwater (1d.); *Abortion in Cattle (1d.); Treatment for Worms in Domestic Animals (1d.); *Lungsickness of Cattle, Contagious Pleuro-Pneumonia, or Pleuro-Pneumonia-Bovum-Contagiosa (1d.); *Swine Fever, Hog Cholera or Pig Typhoid (3d.)—*coloured plates*; Castration of Females and Animals other than the Horse (1d.); Poisoning of Horses by *Ornithogalum Thyrsoides* or Chinkerinchee (*coloured plate*) (3d.); Diseases of the Horse and their Treatment (1s.); Horse Sickness by D. Hutcheon (2d); Ticks and African Coast Fever (1d.); Cirrhosis of the Liver in Stock (1d.); Liver Disease among Calves (3d.); The Arsenite of Soda Dipping Mixture (1d.); *Lamps.

Viticulture.

†Reports on Viticulture (3d.); *Reconstitution of Phylloxerised Vineyards (1s.); Report on Failure of Hanepoot Grapes on American Vines (1d.); The Making of Wine and its By-Products (6d.); How to Treat Wine Casks (1d.); Failure of Vines (1d.); Manufacture of Dry Wines in Hot Countries (3d.)

Miscellaneous.

Game Seasons (3d.); Land Laws of Cape Colony (1d.); †Monsonia: the Cape Cure for Dysentery (1d.); *Rainfall of South Africa (1d.); Sand Dunes of Gascony (5d.); The Metric System (1d.); South African Stud Book, Constitution, Rules, &c. (1d.); Bars in Ostrich Feathers (1d.); *Information regarding the Mining Laws. (1/-)

NOTE.—All those marked with * are obtainable in Dutch and English.

† Dutch only.

THE PRODUCE MARKET.

CAPE TOWN.

Mr. R. Müller, Strand Street, Cape Town, reports as under for the month ending November 20:—

Ostrich Feathers.—The market has been well supplied. The position of the future market appears to be somewhat uncertain, and the result of the December sales is looked forward to with some anxiety, as it is expected that Wing Feathers may be lower.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.		
Super Primes	11	0	0	35	0	0	Floss	..	0	5	0	1	10	0	
Firsts, Ordinary							Long Drabs	..	2	10	0	4	10	0	
to Super	..	7	10	0	10	10	0	Medium Drabs	..	1	5	0	2	0	0
Seconds	..	5	0	0	7	10	0	Short to Medium	..	0	10	0	1	10	0
Thirds	..	3	10	0	4	10	0	Floss	..	0	2	6	1	10	0
Femina (super)	..	7	10	0	10	0	0	White Tails	..	1	15	0	3	0	0
Femina, Seconds								Coloured Tails	..	0	10	0	1	15	0
to Firsts	..	4	10	0	6	10	0	Chicks	..	0	1	0	0	2	0
Byocks (fancy)	..	5	0	0	7	10	0	Spadonas	..	2	10	0	4	0	0
Long Blacks	..	4	10	0	7	10	0	Inferior Black &							
Medium Blacks	..	2	10	0	3	10	0	Drabs, Short							
Short to Medium	..	0	10	0	2	10	0	to Long	..	0	0	6	1	10	0

Wool.—During the past month a considerable quantity of Wool has come forward, and all Clips shewing good quality and staple have met with a ready demand, while wasty Wools are neglected. Sales have been held at Heidelberg, Riversdale, Swellendam, Mossel Bay, and Caledon, the quantity offered being in excess of last season. Prices realised at all these places may be considered satisfactory to the farmers, 10½d. being the highest price paid, while the average is about 9½d. Although prices appear high, latest news from Europe confirm the opinion held here that wools of superior quality and good yield are wanted, while heavy descriptions are neglected.

	s.	d.	s.	d.		s.	d.	s.	d.
Super Long Grass Veld					Short and Inferior	..	0	4	0 4½
Wool	..	0	8	0 10	Wool for Washing	..	0	4½	0 6
Super Long Karoo Veld					Snow-white Super to Extra	..	1	7	1 9
Wool	..	0	6½	0 7½	Ordinary	..	1	1	1 6
Medium Karoo Veld Wool	..	0	5	0 5½	Fleece Washed	..	0	0	0 9½

Mohair.—The market remains dull, and there is little enquiry for hair of any sort at the moment; this has caused stocks to accumulate. Whatever business is going is done in Winter Hair, which may be quoted up to 11½d. for good parcels and for Winter Kids up to 14½d. per lb.

	s.	d.	s.	d.		s.	d.	s.	d.
Mohair, Firsts, Summer	1	1	1	3½	Mohair Winter	..	0	10½	0 11½
„ Kids..	..	1	3	1 7	„ „ Kids	..	1	0	1 2½
„ Seconds	..	0	6½	0 9½					

Hides and Skins.—There is little change to report; both Hides and Skins are in good demand.

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PORT ELIZABETH.

Messrs. J. D'Arvin and Co., report under date November 16 :—

Ostrich Feathers.—The market this week was fully supplied with a fair average assortment, the sale again lasting three days. Competition was rather weak and irregular, and the tone of the market generally easier, though without any quotable change in prices. The parcels sold on the market included a superior plucking grown by Mr. D. J. De Wet, of Prospect, Ashton. The feathers, being of excellent quality, excited active competition, and sold remarkably well, the Whites fetching up to £21 10s. per lb., Feminas £15 15s., etc., etc. Out of hand but little business has been done. At present there is a feeling of uneasiness as to the future of the market, and it is generally anticipated that at the coming December sales in London, there will be some decline on Whites and Feminas, but that Blacks and Drabs will maintain their position. The total quantity sold on the public market this week amounted to £8,877 16s. 2d., and weighed 3,955 lbs. 6 ozs.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
Primes : Extra super				Special Prices.			Blacks : Long ..	3	10	0	6	10	0
Good to super	12	0	0	15	0	0	Medium ..	1	15	0	3	0	0
Whites : Firsts	9	0	0	12	0	0	Short ..	0	10	0	1	0	0
Seconds	6	0	0	8	0	0	Wirey ..	0	1	0	0	1	0
Thirds	3	0	0	4	10	0	Floss ..	0	6	0	1	15	0
Feminas :							Drabs : Long ..	1	15	0	3	0	0
Super	10	0	0	14	0	0	Medium ..	0	12	6	1	0	0
Firsts	5	10	0	9	0	0	Short ..	0	2	6	0	6	0
Seconds	4	0	0	5	0	0	Wirey ..	0	0	6	0	1	0
Thirds	2	10	0	3	0	0	Floss ..	0	6	0	1	15	0
Greys	4	10	0	6	10	0	Spadonas :						
Fancy	5	10	0	8	10	0	Light ..	2	0	0	5	10	0
Tails' White	1	10	0	4	0	0	Dark ..	0	12	6	1	15	0
Light	0	17	6	3	0	0	Chicks ..	0	0	3	0	1	6
Coloured & Dark	0	5	0	1	2	6							

Wool.—This market continues very firm, and a good business has been done in the open market during the week at full current prices; our sales of 900 bales being the most important. On yesterday's public market a limited quantity was offered, prices shewing no change. The next London sales open on Tuesday, the 27th instant, when about 100,000 bales will be offered, and the general opinion is that prices will rule firm.

Snow white Extra						Grease, Short, faulty			
Superior ..	19½d	20d				and wasty	5d	5½d	
Snowwhite Superior ..	17½d	19d				Grease, Coarse and			
Do Good to Superior	16½d	17d				Coloured ..	4½d	4¾d	
Do Inferior Faulty	16d	16½d				Scoured, Coarse and			
Grease, Super Long, well-						Coloured ..	6½d	12d	
conditioned, Grass-	8½d	9d				Basuto Grease, short..	6d	6½d	
veld grown (special clips)						O. R. C. Grassveld			
Grease, Super Long, well-						Grease, long and			
conditioned, Grass-	6½d	7½d				well - conditioned			
veld grown ..						(special clips) ..	7d	7½d	
Grease, Super Long, well-						O. R. C. Grassveld			
conditioned, Karoo	7d	7½d				Grease, long and	6½d	7d	
grown (special clips)						well-conditioned ..			
Grease, Super Long,						O.R.C. medium grown,			
well - conditioned						light, with little			
Karoo grown ..	6d	6½d				fault ..	6d	6½d	
Grease, Super Long,						O.R.C. short, faulty			
well - conditioned,						and wasty ..	5d	5½d	
Mixed Veld ..	5½d	7d				O.R.C. Karoo grown,			
Grease, Light, faultless,						long and well-	6½d	6¾d	
medium, Grassveld	5½d	6½d				conditioned ..			
grown ..						O.R.C. medium grown,			
Grease, Light, faultless,						light, with little	5d	6d	
Karoo medium grown	5½d	6d				fault ..			
Grease, Light, faultless,						O.R.C. short, faulty			
short Karoo grown	5½d					and wasty ..	4½d	5d	

Mohair.—There is a rather better feeling in this market, although there has been no business done yet in either Summer Firsts or Kids. We are, however, in hopes of soon seeing some enquiry set in. There has been a decidedly better enquiry for Winter Hair during the week, and about 800 bales have been sold at 11d. to 11½d., and up to 11½d. for well-grown lots. Winter Kids sold at 14½d., but this price is only obtainable for special clips, there is no demand for ordinary lots. Among the parcels sold was a fine slip from the flocks of the late P. H. Gericke of Aberdeen, comprising 10 bales Winter Kids, which sold at 14½d., and 22 bales Winter, which sold at 11½d. The clip was got up as usual in the best possible manner. On the public market on Tuesday there was no change in prices.

Super Kids	..	1s	6½d	1s	7d	Do. Very Mixed	..	0s	10½d	0s	11d
Ordinary Kids	..	1s	4d	1s	5d	Seconds and Grey	..	0s	8d	0s	9d
Superior Firsts, special						Thirds	..	0s	6½d	0s	6¾d
clips	..	1s	3½d	1s	3½d	Winter Kids (special					
Ordinary Firsts	..	1s	3d	1s	3½d	clips)	..	1s	2½d		
Short Firsts	..	1s	1d	1s	1½d	Winter Kids (good					
Superfine Long Blue,						ordinary)	..	1s	1d	1s	2d
O.R.C. Hair	..	1s	2d	1s	3d	Winter Hair	..	0s	11d	0s	11½d
Mixed O.R.C. Hair											
(average)	..	0s	11½d	1s	0½d						

Skins.—Sheepskins sold in bundles, at 7d. per lb.; and Pelts at 6d.; Capes, 2/3 each; damaged, 8d. each; Angoras, 8½d. per lb.; Shorn, 6d.; damaged, 4½d.; Goat, 13d.; damaged, 6½d. per lb.; Springbok, 9d. each.

Hides.—Sundried sound Hides sold at 9d., and damaged 6½d. per lb.; Drysalted, 8d.; damaged, 6d.; and Thirds, 3½d.

BREEDERS' DIRECTORY.

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HORSES.

Hugh A. Wyndham, Kromdraai Stud, near Standerton, Transvaal. Stud Stallions, Season 1906-1907. Broxton, d.b.h., 15-3. He is very well bred, being by Ayrshire, winner of the Derby, out of Farewell, winner of the 1,000 guineas, by Doncaster, winner of the Derby, out of Lily Agnes, dam of Ormonde, winner of the Derby, her dam Polly Agnes by the Cure—Miss Agnes by Irish Birdcatcher. Thoroughbred mares, £10 10s.; limited number of approved mares, £5 5s.

Narhillah, ch. h., 15 hands, by Baliol, out of Little Nell, by Lammernmoor. He won several steeplechases in England, and ran seventh in the Grand National in 1904. Thoroughbred mares, £7 7s.; approved mares, £3 3s.

CATTLE.**HEREFORDS.**

Young bulls for sale, sired by "Chain Armour" ("Armour Plate," 19838,—"Patience"). First prize winner Port Elizabeth and East London Shows, 1905-1906. Mr. B. WEBB, ARUNDEL STUD FARM.

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Thoroughbred Herd. Celebrated Island bred bull "Clove," and several of the best cows and heifers from Mr. H. W. Struben's late herd.—Mrs. A. A. Dunn, De Tuin, Piquetberg.

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Pure Frieslands. Enquire for cows, young bulls, and heifers. Oldest pure herd in Eastern Province. Grand milkers. Prize stock. Also, Colonial Rambouillet Flock Rams, limited number.—F. F. WIENAND, Bellevue, Bedford, C.C.

R. Cross, HILLSIDE, P.O. BOLOTWA. Will have high-class Friesland bulls for sale from February next. Herd may be seen by appointment. Bulls from Imported and Colonial Cows.

Cattle—continued.**DEVONS.**

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R. Pell Edmonds, RIPLEMEAD, DOIRNE. Breeder of Pure-bred Pedigree Merino Sheep and Pedigree Black Welsh Cattle.—For particulars, see page xxxviii.

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